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THE PHYSICAL EDUCATION MANAGEMENT SYSTEM (PEMS)
SUMMARY

Marv Westrom and Alex Carre

The Physical Education Management System (PEMS) is a set of microcomputer (APPLE) programs designed to help secondary school Physical Education Teachers keep accurate student achievement records in accordance with the 1980 British Columbia Ministry of Education PECRG (Physical Education Curriculum Guide and Resource Guide). The PECRG outlines a curriculum foundation, a record keeping system, and an evaluation format to significantly increase the focus on individual student needs. Detailed records must be kept of the beginning and ending skill and knowledge level attained by each student for each activity. The quantity of data and the analysis needed to interpret this data are large enough to prevent many Physical Education teachers from considering use of the Ministry's suggestions.

PEMS was built to make the teachers' job easier. It was designed, implemented, and tested over a two year period ending in June, 1983. The study was conducted by Dr Alex Carre and Dr Marv Westrom of the University of British Columbia. Trials were done at Charles E. London School Junior Secondar School in Richmond. Gary McBride headed the teacher team consisting of Physical Education teachers Rob Forbes, Pat Griffin, and Cathy MacDonald; and Computing teacher Pat Trembath. PEMS was initially designed and programmed by Bob Corbett; Bill Trembath developed the final system.

The major study findings were:

- The PECRG suggests thorough, detailed, and extensive records be kept on individual student achievement; a formidable task for Physical Education teachers. The study determined that the that the school costs (microcomputer equipment, teacher time and clerical time to use the system) would be offset by sufficient benefit (better and more timely record retrieval, increased capability to individualize Physical Education programs) for the system to be cost-effective.

- The teacher costs (time to use the system) were offset by sufficient benefit (better and more timely record retrieval, reduced frustration, typed reports, increased capability to individualize) for the system to be desired by the teachers.

- Numerous revisions were needed to build PEMS. Making it operational for all B.C. schools was seen as desirable, but beyond the scope of the project. If the development of PEMS had had to be paid for at programmers rates, it could not have been built. In general, the B.C. school software market is too small to support development of such systems.

- The London P.E. teachers had had a lot of computer experience by the end of the project, and would be considered 'computer literate'. Yet they reinforced the need for a computer 'expert' in the school (or at least in the district). Districts planning to introduce software systems into their schools should plan to make a computer expert available as well.

THE PHYSICAL EDUCATION MANAGEMENT SYSTEM (PEMS)

FINAL REPORT

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October, 1983

The Physical Education Management System (PEMS) is a set of microcomputer (APPLE) programs designed to help secondary school Physical Education Teachers to keep accurate student achievement records in accordance with the British Columbia Ministry of Education Physical Education Curriculum Guide and Resource Guide (1980). The system was designed, implemented, and tested over a two year period ending in June, 1983.

Portions of the 1980 curriculum guide were pilot tested in Charles E. London Junior Secondary school in Richmond, B.C. During this pilot, Dr Alex Carre and the London school P.E. staff recogized the need for a computer-based mark management system, which led to the programming of the PEMS system by Mr Bob Corbett. This evaluation study was conducted by Dr Alex Carre and Dr Marv Westrom of the University of British Columbia. Trials were undertaken at London School (principal Mr R. Carkner). Under Mr J. Strilesky (Administrative Assistant in charge of Physical Education), Mr Gary McBride headed the teacher team consisting of Physical Education teachers Mr Rob Forbes, Miss Pat Griffin, and Mrs Cathy MacDonald; and Computing teacher Mrs Pat Trembath. The final PEMS system was programmed by Mr Bill Trembath.

The successful completion of this study was due mainly to the work of these people; and our appreciation extends to the rest of the staff and the students at London Junior Secondary. In particular, it is appropriate to cite the Educational Research Institute of British Columbia (ERIBC) for a major grant supporting this project, and Mr Bill Trembath, who gave a great deal of his time and exceptional talent to making the final version of PEMS work to everyone's satisfaction.

INTRODUCTION AND PROJECT OVERVIEW

This report contains four major sections: Introduction and Overview, Results, Conclusions, and Appendices. The Introduction provides a rationale for conducting the project, how the project unfolded, and an overview of the PEMS system. The data collected is reported in the Results section, and the experimental findings are reported under Conclusions. Appendix A contains an overview of the 1980 Physical Education Curriculum Guide and Resource Guide (herinafter referred to as the PECRG). Appendix B contains a system study of the Physical Education teachers record keeping tasks and PEMS conducted during February-March by a group of Commerce 356 students; Appendix C is the User Documentation for PEMS. Appendix D is the final data questionnaire.

BACKGROUND

In early 1980, the British Columbia Ministry of Education released the PECRG detailing Physical Education curruculum for secondary schools and suggesting evaluation techniques and records to be kept in individualizing students' programs. This revision, released in the Spring, was the first major change to the British Columbia Physical Education curriculum since 1961 and represented a significant change of aim and intent. An overview of the 1980 quide is presented in Appendix A.

During the 1980-81 school year, Bob Corbett took an EDUC 449 (individual study) course in his B.P.E. program under Dr Marv Westrom at UBC. He chose a project involving the development of APPLE-based programs to help teachers keep track of the records suggested by the 1980 PECRG. In September 1981, Mr Corbett began teaching Physical Education at Charles E. London Junior Secondary School in Richmond, B.C. With the help of his principal and school board, he was able to acquire sufficient resources to implement the computer programs he had developed while at UBC. Part way through the school year, his results were positive enough to suggest the need for further examination by Dr Alex Carre (who had been involved in the development of the new Curriculum Guide).

Dr Carre and Dr Westrom applied to ERIBC for a major grant to investigate Corbett's system more thoroughly. The System was christened PEMS (for Physical Education Management System). The grant was forthcoming and this report was produced as a result of the ensuing study.

THE PURPOSE OF THE STUDY

The purpose of the study was to determine if a microcomputer could be used to provide significant assistance to regular secondary Physical Education teachers who were following the new curriculum guide. There was no doubt that the progams would "work", but the study would determine if the costs (microcomputer equipment, teacher time and clerical time to use the system) would be offset by sufficient benefit (better and more timely record retrieval, increased capability to individualize Physical Education programs) for teachers to want to use the system. The PECRG suggests thorough, detailed, and extensive records be kept on individual student achievement in Physical Education. Keeping of such records represents a formidable task to Physical Education teachers. If PEMS proved to be effective, it would make implementation of the management of individual differences suggested in the new curriculum guide more feasible.

THE NEED FOR THE STUDY

The PECRG outlines a curriculum foundation, a record keeping system, and an evaluation format that should improve Physical Education instruction in British Columbia schools by significantly increasing the focus on individual student needs. To accomplish this goal, detailed records must be kept of the beginning and ending skill and knowledge level attained by each student for each activity. The quantity of data to be kept and the amount of analysis needed to interpret this data are large enough to prevent many Physical Education teachers from considering use of the Ministry's suggestions.

There is an increasing number of APPLE computers in British Columbia schools, The 1980 Ministry of Education Pilot Project introduced more than 100; a count done by Dr Robert Jones (SFU) in 1983 showed nearly 3000 micros in British Columbia schools; 65% of them APPLEs. There is every indication that micros in schools will continue to increase dramatically and that most British Columbia Physical Education teachers now have or soon will have access to an APPLE.

OVERVIEW OF THE PROJECT

At initiation, the project consisted of two major phases:

1. Pilot Implementation of Corbett's original programs and site testing for three months (ending June '82).

   Revision of the programs in light of experience gained with the pilot implementation (ending August '82).

2. Implementation of the revised programs and final assessment (ending January '83).

Phase 1 went as planned. The pilot implementation was conducted and assessed; Corbett made changes to the programs during the summer months based upon what we learned during the pilot. However there were two setbacks: Corbett was not re-hired at London Junior Secondary, and the Ministry of Education decided that Physical Education should be made a year-through (rather than a semestered) course. Phase 2 was planned under the assumptions that Corbett would be available in the school, and that Physical Education would be semestered.

We started Phase 2 planning to have Corbett commute from Sechelt (where he was now teaching) to London School on an as-needed basis. We further planned some significant program revisions (partly to handle the year-through courses). The program was implemented in September, but by Christmas it was clear that further significant revisions would have to be made. Corbett made further changes during the Christmas break, but there was not enough time to make all of the changes that were needed. Because of pressures of his job and the travel involved, it was not possible for Corbett to continue to be responsible for the programming once school resumed; for this reason we sought and found an alternative programmer, Mr William Trembath.

Trembath took over the programming and Data Clerk tasks for the second semester at London school. It was at about this time that the Commerce 356 students began their study. From the experience we had gained, it was clear that a different form of data organization would be better. Because we were starting with a new programmer, and in light of the need for a data format change and significant revisions, Trembath decided to essentially re-write the entire system. The Commerce students' study (see Appendix B) was completed in time to have some impact on the design. In addition to the reprogramming, Trembath also entered the backlog of data from the first semester. By being readily available at the school while the project was underway, Trembath was able to further "fine tune" the PEMS programs to the London teachers' needs. During this last revision process, Drs Carre and Westrom attempted to ensure that the PEMS programs would not only meet the needs of London teachers, but would be generally useful to Physical Education teachers in British Columbia.

The revisions and data entry work were completed smoothly and successfully. As the results show, the teachers using PEMS (despite the difficulties they had to endure through the many program revisions) were quite happy with the final results. All of them are looking forward to using the system next year.

OVERVIEW OF PEMS

The PEMS system has now gone through three major revisions. It was developed by Corbett during the Spring, revised during the summer, and revised again during the Christmas break of 1982. It was then essentially re-written by Trembath in the Spring of 1983 and subsequently "fine tuned". All of these revisions were done in light of experience gained while using PEMS in the school and all have made quantum improvements in PEMS functionality and ease-of-use. The improvements made during the first revision were reported in the Interim Report to ERIBC (August, 1982). The Commerce students' study (Appendix B) presents PEMS as it was after the second major revision. This section contains an overview of the final version of PEMS; a more complete description is provided in the User Documentation (see Appendix C).

The purpose of PEMS is to keep track of Physical Education mark information for all students in a school. Each grade is allotted one MAIN DATA diskette, which contains a data management program and records for each student in that grade. The data kept here consists of:

- the student's full name, sex, and division number.
- the student's Skill Level (SL), Cognitive Level(CL) and Grade (GD) obtained in each of 19 possible units in grades 8 through 11.
- the student's report card marks for each of the five reporting periods in grades 8 through 11.

The management program allows the user to:

- Add new students to the grade.
- Delete students from the grade.
- View and change individual student records.
- Print out lists of students in a grade.
- Print out "Permanent Record Cards" (containing the above data) for groups or individual students.
- Create new MAIN DATA diskettes.

It would not be convenient for teachers to have to go to these MAIN DATA diskettes every time they wanted to view or change student marks. Normally, they need only be concerned with the students and the units they are currently teaching. For this reason the PEMS system also includes a TEACHER diskette.

The TEACHER diskette contains files of records for each CLASS taking a particular Physical Education unit. Each teacher has their own TEACHER diskette. They may add a class file to this diskette at any time by identifying the unit (topic) and entering the student numbers for all students taking the unit. The student names and previous marks for this unit can then be "forwarded" or copied from the MAIN DATA diskette(s) to the TEACHER diskette so that each TEACHER diskette contains all needed information.

The TEACHER diskette management program allows the teacher to:

- Create new class files, forwarding data from the MAIN DATA diskettes.

- Enter and change student marks for any class.

- Print out class lists with student names, past marks, and spaces for entering new marks and attendance data.

- Transfer updated marks back to the MAIN DATA diskettes.

- Delete class files (after the data has been transfered back to the MAIN DATA diskettes, the class files may no longer be needed).

- Create new TEACHER diskettes.

All of the programs are menu-driven with full-screen editing features. They are self-explanatory and very easy to use. Samples of the various printouts that can be produced are included in Appendix C.

mRESULTSm

Experimental results were collected at the end of Phase 1 (reported in the interim report of August 1982) in December 1982, and at the end of Phase 2 in June of 1983. While all of the results have been useful in improving PEMS, only the June results are reported here because only these are relevant to the current PEMS system. (An analysis of PEMS and teacher tasks as of February is contained in Appendix B.) When the project was conceived, it was anticipated that teachers would keep detailed records of their time spent in following PECRG using PEMS and not using PEMS. However because of the many changes made to the system during the course of the project, these records were clearly not going to be representative, and therefore were not maintained. Instead, the results were derived from a questionnaire (Appendix D); interviews conducted with Rob Forbes, Pat Griffin, Gary McBride, Cathy MacDonald, and Bill Trembath; and ongoing analyses by Drs Carre and Westrom. The data collected is therefore not as exact as we would have wished, but the fact that teachers had focused their attention on keeping track of their time probably increased the accuracy of their time estimates.

The purpose of the evaluation was to determine whether the perceived BENEFITS of using PEMS were 'worth' the COSTS associated with using the system. In addition, an examination of appropriate PROCEDURES for using PEMS was made.

COSTS

The cost of using PEMS consists of three major components: computing equipment and supplies, clerical time, and teacher time.

During the project, an APPLE II+ (48K) microcomputer with one disk drive and an Epson MX-100 printer were used. Only one disk drive was needed. The printer speed and quality were acceptable. No other computer hardware was considered necessary.

London school has three grades (8, 9, 10) and five teachers of Physical Education. One MAIN DATA diskette was needed for each grade, and each teacher needed one TEACHER diskette (for a total of 8 diskettes). A back-up copy of each diskette was kept (another 8 diskettes) so that a total of 16 diskettes were used. Allowing for loss and accidental destruction, 18 diskettes would be ample for this school. Approximately 1200 sheets of printer paper were used. Allowing for one printer ribbon, the total cost of supplies needed to run PEMS for a year at London school would be about $75.00.

The London teachers learned to use PEMS by just sitting down and starting to use it. They estimated that within 1.5 hours they were able to use PEMS effectively. None of them had any prior

computing experience. Since they also were able to complete necessary PEMS clerical tasks during this time, and they learned the system on an early (inferior) version, actual net time to learn to use PEMS is estimated at less than 1 hour.

When entering marks, the most efficient procedure evolved to have two teachers cooperate - one reading the marks and the other entering the data. These teachers would enter their marks for the unit just completed, create their new class lists for the next unit, and print out mark gathering forms for each class all at one sitting. Following this procedure for one unit took about 3 minutes to enter marks, 5 minutes to generate class lists, and 4 minutes to print new forms. A teacher with a full Physical Education load would have about 6 classes; so the average time to complete this task would be 72 minutes (1.2 hours) per teacher. The units being taught are changed and the students re-assigned to new classes approximately every six weeks. Units change so that each class can take from 6 to 9 different units (topics) per year. In this analysis, it is assumed that each class takes six units per year; this results in a minimum total of 7.2 hours per year spent on record keeping.

Teachers were asked to compare the time taken to follow the 1980 PECRG using PEMS with the time needed to follow the guide prior to having PEMS. The procedure before PEMS was available was as follows. Teachers would make a (hand written) class list (5 minutes), and then assemble all of the PR cards for the class (5 minutes, providing the cards were properly filed). After completing the unit teachers would enter the marks on the PR cards (15 minutes), and re-file the cards (10 minutes). The estimated time for one teacher to do the record keeping for one unit was 35 minutes. A teacher with 6 Physical Education classes, doing six units per class would spend 21 hours on these activities. In addition, about 3 hours per teacher were needed at the end of the year for sorting and filing the PR cards. Total time per teacher - 24 hours per year.

BENEFITS

The teachers at London school felt that the PECRG guidelines had significantly improved their Physical Education program. They felt it increased teachers' ability to accomodate individual differences, that its application was intrinsically motivating for the students, and that its continued use had significantly improved the quality of the Physical Education program in the school. However it would appear that the use of the PECRG before PEMS was introduced was sustained only through the dogged determination and extra effort invested by the Physical Education teachers in looking up past marks and recording new marks; and especially by ensuring that students' Permanent Record Cards were collected and re-sorted periodically.

The teachers felt that using PEMS made the PECRG much easier to use. That it saved teachers time, that it enabled them to

easily obtain accurate relevant information when it was needed, and that the capability of quickly obtaining historical data enhanced the basic ideal of continuous progress in Physical Education. Making all class lists at the beginning of the year was perceived by the teachers to reduce their clerical load. Teachers also felt that students were more motivated because they were able to review activities they had taken in the past and they saw that teachers were attending to their past achievement. Teachers felt that, in particular, knowing students' past attained skill and cognitive level was particularly valuable.

PROCEDURES

At the outset, it was thought that some necessary clerical tasks associated with using PEMS might be better done by a data clerk instead of the teachers. It was felt that the best procedure would be for a clerk to enter the the student numbers to create the class files and for the teachers to manage the marks. It was also felt that a school clerk, a selected junior or senior high school student, or a parent aide could do these tasks. At the outset, a junior high school student, competent in the use of PEMS, was available. But due to competing interests, he was unable to maintain responsibility for keeping the data entry tasks up-to-date. Because of the need to train someone to do this relatively small amount of clerical work, and in light of current restraint measures in British Columbia schools, it was felt that the simplest mechanism would be for the teachers to do it themselves.

The Physical Education teachers actually need very little time with the microcomputer to use PEMS. They felt that the computer could be located anywhere in the school (ie: it did not need to be in a Physical Education office), but that some mechanism for reserving a time slot in advance was desirable. Class lists and mark gathering forms had to be generated at certain times (whenever units were changed), but the marks could be entered any time.

The teachers had some Data Clerk support from Corbett and Trembath during the project, but none during the final trial. They felt that having a clerk assist them would be of value, but that it was not essential. A small amount of technical assistance from a computer specialist was considered necessary however.

mCONCLUSIONSm

Drawing on the information presented above (RESULTS), the following conclusions are presented concerning the costs of using PEMS, the benefits to be derived from PEMS use, and procedures for using PEMS. Some general overall comments conclude the report.

COSTS

The cost of using PEMS can be separated into two major categories: Supplies and Equipment, and Teacher and Clerical Time. Each of these are discussed below:

mSupplies and Equipmentm

An APPLE IIe (48K) computer system with one disk drive is currently being sold for about $2,000. A suitable printer can be purchased for less than $1,000. Each teacher would need to use the computer for about 1.2 hours, six times per year, or 7.2 hours per year (plus 1.5 hours initial training the first year). Assuming that a school year has 180 days and that the computer would be 'useable' about 10 hours per day (or 1800 hours per year), this amounts to less than one half of one per cent of the available time. Assuming that the cost of an APPLE could be amortized over five years, the cost of computer equipment for running PEMS for one teacher for one year would be:
($3000 x 0.5% / 5) = $3.00

Assuming that there were 5 Physical Education teachers in a school, the total cost of facilities and supplies to use PEMS would be:

Computer equipment (5 x $3.00)	=	$15
Supplies (diskettes, paper, ribbons)	=	75
TOTAL annual cost for supplies and equipment ...		$ 90

Of course this analysis depends upon there being some other necessary uses for the microcomputer in the school. If a micro were purchased solely for this application, the annual cost for supplies and equipment for running PEMS for 5 Physical Education teachers would be $675.

mTeacher and Clerical Timem

Teachers worked in pairs to create class files and enter marks. This activity was estimated at 8 minutes per unit, but if there are two teachers working, the total time spent would be 16 minutes per unit. Adding the 4 minutes to print forms results in a total of 20 minutes of teacher time needed to do all PEMS activities for one unit for one class.

ACTIVITY	TIME
Entering marks	3 minutes
Creating class files (entering student numbers)	5 minutes
Printing forms	4 minutes
Helping another teacher	8 minutes
TOTAL	20 minutes

TABLE 1: Time spent using PEMS by one teacher for one class

A Physical Education teacher would have an average of six such classes, and these classes would change units six times per year (approximately every six weeks), so that this 20 minutes would have to be spent 36 times per year. This results in a total of 12 hours per year that each teacher would have to spend using PEMS or helping another teacher use PEMS.

ACTIVITY	TIME
Entering marks	1.8 hours
Creating class files	3.0 hours
Printing forms	2.4 hours
Helping other teachers	4.8 hours
TOTAL	12.0 hours

TABLE 2: Time spent using PEMS by one teacher for all classes for one year

A teacher working 7 hours per day for 180 days, works 1260 hours in a year. At an annual salary of $30,000 this amounts to just under $24 per hour.

The London teachers estimated that the total time required to follow the PECRG without the use of PEMS would be 24 hours per teacher per year. The cost of 5 Physical Education teachers' time to do the PECRG record keeping would be (5 x 24hrs x $24) $2,880.

If a school is now using or plans to implement the PECRG recommendations, adopting PEMS would result in a net saving of teacher time. Using PEMS, the equivalent required teacher time was 12 hours. The total cost of teacher time for five Physical Education teachers in a school would be (5 x 12hrs x $24) $1,440.

Using PEMS, the cost of teacher time could be further reduced in several ways. Of the 12 hours spent per year using the system, only 1.8 hours (for entering marks) actually require the teacher's participation. The other 10.2 hours could be done by someone else. If a student or parent aide instead of another teacher were used to assist with class file generation and entering marks, this would save the 4.8 hours of helping time. This assistant could also (easily) supervise the printing of the class forms, saving another 2.4 hours of the teachers' time. This leaves the teacher with 4.8 hours of work to do each year. The time cost under this scenario for five teachers would be (5 x 4.8hrs x $24) $576.

With five teachers, a total of 60 hours would be required to do PEMS, 9 of them by teachers. The remaining 51 hours of work could be done by a clerk. If a clerk were doing this work, it would not be necessary to have a 'helper', because clerks are trained to read and type at the same time. This reduces the clerical time to only 27 hours per year. Since a clerk would be more skilled at typing, and since other tasks could be done while the forms are printing, the total clerical time needed to run PEMS (for a clerk) would likely be about 24 hours per year. It could be arranged so that this occured in six 4-hour sessions during the year. The time cost under this scenario would be (9hrs x $24) $216 for teachers plus (24hrs x $10) $240 for the clerk for a total of $456.

mTotal Costsm

Under the most unfavourable assumptions (computer purchased solely for this application, no clerical help), the total cost for a school with 5 Physical Education teachers to use PEMS for a year would be still be less than the cost without PEMS ($2,880).

Supplies	-	$ 75
Equipment	-	600
Teacher time	-	1,440

TOTAL cost		$2,115 per year.

Under the most favourable assumptions (computer acquired for other applications, school clerk time provided), the total cost would be:

Supplies	-	$ 75
Equipment	-	15
Teacher time	-	216
Clerical time	-	240

TOTAL		$ 536 per year.

The most likely scenario is that the computer would already be available in the school, that no clerical time would be provided, and that the teachers would do all of the work themselves. Costs for five teachers to use PEMS in this case would be:

Supplies	-	$ 75
Equipment	-	15
Teacher time	-	1,440

TOTAL cost		$1,530 per year.

Of course Physical Education teachers normally do most of the tasks included in this estimate (such as making class lists, recording marks, and making mark forms) whether they use PECRG or PEMS or neither of these. Using the PECRG adds a significant clerical burden; probably 6 hours per teacher per year if PEMS is used, 18 hours per teacher per year if it is not.

BENEFITS

As is not uncommon with studies of this kind, costs can be estimated quite accurately, but quantifying the benefits is more difficult.

The teachers at London have been following the PECRG since it was released in 1980. Some of the benefits that teachers cited for PEMS were benefits that would more properly be attributed to the PECRG (such as increased capability to deal with individual student differences and the range of student expectations, motivation, and improved quality of program). However, after using PEMS it was clear that the instructional benefits of the PECRG were enhanced by PEMS.

While it is only marginally more difficult to record marks by hand than via PEMS, the computer system makes periodic collecting and sorting of marks automatic. This eliminates tiresome tasks at the beginning and end of each unit, and eliminates the year-end hassle of locating and re-filing the many Performance Record cards.

Additionally, it makes the production of accurate and timely reports on past student marks very easy. Teachers require information on each student's achievement the last time he took the topic at the start of every new unit. PEMS combines this information with a mark-gathering form to make the teachers' management tasks much simpler. It short, it makes using the PECRG much more feasible than it had been before.

PROCEDURES

By the teachers' time estimates, less than one fifth of the clerical work they did while using PEMS really had to be done by them. There are three alternatives to the teachers doing this work. It could be done by a student, by a parent aide, or by a school clerk.

Questions concerning security were raised by the teachers if a student were allowed to do this work. Would a student possibly alter marks to favour his friends (or hurt his enemies)? Or perhaps a student would just make careless mistakes that could result in improper marks. These objections could (the teachers felt) be overcome by the teacher examining the marks after they were entered.

Other problems with using a student assistant also apply to using a parent aide. The student or parent aide could not be counted upon to continue in the task for a long time, so that retraining would have to be done frequently (perhaps twice a year). Further, a complex task that has to be done only once every six weeks is not the kind best done by voluntary assistants. This approach would likely involve a considerable amount of teacher supervision and assistance - perhaps more time than was being saved.

The teachers did not consider the possibility of using a school clerk as a serious alternative. They felt that obtaining permission to have a regular clerk do this task was unlikely because the clerks were always too busy. If their perception is correct, it is too bad. Using a school clerk would be both more efficient and less costly; it would also give the teachers a feeling of 'support' from the front office. However having the teachers do the tasks would not result in any incremental cost where a clerk might be able to claim a few hours of overtime.

In the final trials, the teachers did all of the clerical work. The school had a number of APPLEs in a computer laboratory and the teachers were able to arrange to use one of them easily, at almost any time, and on short notice. They felt no need to have their 'own' computer. They felt that if the machines were heavily used, they would be willing and able to participate in a 'booking' system where they would sign-up for time slots in advance. However this was not tested.

If a parent aide or a clerk were employed to help the teachers however, it is likely that some special arrangements would have to be made. It would be reasonable to have the helper work for a pre-scheduled period of at least several hours. A system where teachers would submit PEMS work to be done on (computer produced) forms was discussed, but not tried. However the teachers did not have any exacting requirements for when work had to be completed, and the need for forms was always known well in advance. There does not appear to be any reason why a procedure involving a helper who would do PEMS tasks in response to teacher forms could not work successfully and efficiently.

GENERAL COMMENTS

At the outset of this project, it seemed to the authors that the chances of PEMS being successful were about 50-50. If we had continued the project with the system as completed up to the end of February, PEMS would probably have been judged a failure. We were very fortunate on two counts: we had the time for one more system revision and trial before the project ended, and we were able to obtain the services of Mr Trembath at a price the project could afford. Mr Corbett's original ideas for PEMS were good, and his programs were as complete as could be expected with the information we had. However the three major iterations of testing and re-writing were needed to improve the system to a point where it was effective.

Creating microcomputer software is a difficult task. In spite of the expertise that the project had in both Physical Education and software development, many of the real difficulties we faced in making the software fit the teachers' needs were not foreseen. If the time of the developers and experimenters had had to be paid for at software development rates, PEMS could not have been produced. The B.C. market is just too small; it would have been too expensive. Even with the system now working

properly in London Junior Secondary, modifications will likely be necesary in moving it to another school. Only after it was working effectively in three or four schools would it be ready for province-wide distribution. This type of software can be produced for B.C. schools only if it is heavily subsidized.

The teachers using PEMS had worked with the computer and the system for about one and one half school years at the end of the project. Yet they still felt that a computer specialist 'on call' was needed. Even with their obvious competence with PEMS, they wanted someone available to help them in the event that anything went wrong. Their experience is likely generalizable to other teachers who might use computers. School boards wanting teachers to use computers widely in their district are well-advised to provide a computer specialist for each school, or at least 'on call' for the district.

APPENDIX A

BRITISH COLUMBIA PHYSICAL EDUCATION CURRICULUM GUIDE AND RESOURCE GUIDE (1980) OVERVIEW

APPENDIX A

1980 SECONDARY PHYSICAL EDUCATION CURRICULUM GUIDE OVERVIEW

The Ministry of Education, Curriculum Development Branch, initiated the revision of the Secondary Physical Education Curriculum in the spring of 1977. Its principal author and committee chairman was F. Alex Carre and the revision was completed in 1980.

The need to revise the 1961 Secondary Physical Education curriculum guide became apparent when physical educators throughout the province began modifying programs to meet the changing needs of students and society. These new programs emphasized involvement in the life-time physical activities and recognized individual student differences. It was felt that the provincial curriculum should more closely reflect these new directions.

The curriculum guide was developed on the basis of a number of sources of information, including the results of the 1979 Assessment of Physical Education.

The guide has been organized into two parts. Part A, the Curriculum Guide, contains the overall intent and content of the program. General statements outlining teaching considerations and evaluation are also included. Part B, the Resource Guide, includes activity sequence charts and practical ideas and suggestions to aid teachers in implementing the program.

The previous curriculum (Physical and Health Education, 1961) outlined five objectives for the Physical Education program. The goals included in the revision incorporate and extend these objectives. Learning Outcomes further specify the goals. In addition, specific outcomes in the affective, cognitive and psychomotor domains were developed for each activity category.

The previous curriculum also divided the content into two categories, a boy's program and a girl's program. Each of these two categories was divided according to grade levels. Grade 8 activities were listed separately while the activities for grades 8, 10 and 11 were combined into a single listing.

The present curriculum (Physical Education, 1980) outlines a wider range of activities extending across seven major categories as outlined below.

Outline of Activity Categories

Team Games	Individual and Dual Activities	Gymnastics	Dance	Aquatics	Fitness	Outdoor Pursuits
*Basketball	*Archery	*Men's Artistic	Creative	Diving	*Fitness Concepts	Backpacking
*Field Hockey	*Badminton	*Women's Artistic	*Folk	Skin Diving	*Fitness Evaluation	Camping
*Flag Football	Bowling	*Modern Rhythmic	Jazz	*Swimming	*Training Principles	*Canoeing
*Lacrosse	*Cross Country Running	Trampoline	*Social	*Synchronized Swimming	*Cardiovascular Endurance	*Cross Country Skiing
*Rugby	Curling		*Square		*Strength and Muscular Endurance	Downhill Skiing
*Soccer	Golf				*Flexibility	Kayaking
*Softball	Handball				*Stress and Relaxation	*Orienteering
*Team Handball	*Ice Skating				*Nutrition	Sailing
*Volleyball	Judo					*Snowshoeing
	*Racquetball					
	Roller Skating					
	*Squash					
	Table Tennis					
	*Tennis					
	*Track and Field					
	*Wrestling					
	Yoga					

*Skill Charts for these activities are including in the Resource Section.

These activities are not meant to be all inclusive or prescriptive in nature but are representative of physical activities through which the Goals and Learning Outcomes can be attained in the affective, cognitive and psychomotor domains. It is recognized that additional activities may be developed locally in keeping with unique learning conditions and needs.

By the end of the Secondary Physical Education program, the vast majority of students will have achieved a degree of appreciation, understanding and proficiency in a variety of activities from each category.

It is recognized, however, that considerations such as facilities and equipment will limit the scope of the program (e.g. aquatics).

These seven categories were selected to provide a balance between the more traditional approaches to Physical Education and the emerging emphasis on lifetime activities. The revision proposes that students should participate in a comprehensive program of physical activities. The following Time Allotment Chart was prepared in order to assist schools in designing a balanced program.

SUGGESTED TIME ALLOTMENTS

GRADE LEVEL	TEAM GAMES	INDIVIDUAL AND DUAL ACTIVITIES	GYMNASTICS	DANCE	AQUATICS	FITNESS*	OUTDOOR PURSUITS
8	20-40%	10-20%	10-20%	10-15%	10-15%	10-15%	10-15%
9	20-35%	15-30%	10-20%	10-15%	10-15%	10-15%	10-15%
10	10-20%	20-30%	10-20%	10-15%	10-15%	10-15%	10-15%
11	up to 20%	up to 40%	up to 20%	up to 20%	up to 20%	up to 30%	up to 30%

*Fitness can be integrated with the other categories and/or treated as a separate instructional area.

It is intended that schools will determine, within the suggested guidelines, exact time allocations for each category. The guidelines presented in the above chart are based on the following criteria:

- 100 - 120 hours of instructional time should be allotted for Physical Education at each grade level,
- students should participate in a comprehensive program of physical activities,
- schools vary in the availability of appropriate facilities, equipment and expertise, and
- as students progress into the senior grades, they should have increasing opportunity to select activities which reflect their individual needs and interests.

TEACHING AND PROGRAM CONSIDERATIONS

The guide is organized to assist the teacher in planning for instruction. It is recognized that teachers organize and present instruction in a variety of ways. It is not the intention, therefore, to mandate any specific teaching methodology. Activity sequence charts, organized into developmental phases or levels, were developed to be a reference for teachers in planning their units of instruction. These charts can assist the teacher in working with a range of student groupings, such as the whole class, small groups, pairs or individuals.

Suggestions are also provided in managing the Physical Education program. Topics include the following: remedial programs, dress, safety, co-curricular programs, co-educational classes, time allotment and scheduling.

As can be seen from this summary, extensive changes in aim and intent for Physical Education are indicated in the 1980 Curriculum Guide. These changes will require increased demands on the teacher of P.E. in terms of accountability related to record keeping and program management. The need is clear, therefore, for the development of a computer-assisted management system to aid in the requirements initiated by the new curriculum.

APPENDIX B

COMMERCE 356 STUDENTS' REPORT

ANALYSIS OF A P.E. MANAGEMENT SYSTEM

COMMERCE 356

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EXECUTIVE SUMMARY

The purpose of this report has been to analyze and recommend improvement to a P.E. marking and information system. We found that in general that the existing manual system, while having certain problems, should remain essentially the same, with the exception of possibly implementing and using a computer to store and retrieve specific student information on a timely basis as required by the teacher. One slight modification to the manual system that we have suggested is the use of a slightly different form design.

We began by learning the existing manual system and fully documenting this by drafting a data flow diagram and writing a detailed description of the existing system. At the present time, students are sorted into units based on their chosen activity, as opposed to their being registered in a certain class. The composition of these units changes with each new activity, the only constant being that the students in the two units together consist of all students permanently registered for that P.E. block.

There are three main objectives of a P.E. information system: 1) to provide relevant information on the students, 2) to provide timely information, and 3) to minimize administrative functions of the P.E. teacher in order to increase instructional time.

The constraints to be noted are: 1) minimize cost, 2) use existing computer equipment only, 3) labour available for data entry, and 4) limited technological knowledge of the users.

From observing the system we identified the following problem areas: 1) attaining previous information on a student is difficult and sometimes impossible, 2) class time is being wasted on administrative matters, and 3) marking and record keeping processes contain many redundancies and much paperwork.

The above problems were then analyzed and a list of alternatives was formed. The alternatives comprise a range in the amount of reliance on a computer system. The alternatives are: 1) maintain status quo, 2) improvement of the manual system, 3)implementation of a computer system combined with an improvement in the manual system, 4) implementation of a computer system with computational capabilities, and 5) the 'ideal' system.

Based on the problems noted and given the constraints, we have recommended the implementation of a computer in a limited capacity. The computer would only be used to 1) generate unit lists, and 2) store permanent record information on each student. A small change to the manual system is the recommendation of using a slightly different format on the record keeping forms A data flow diagram for the recommended system is provided.

INTRODUCTION

Our analysis is of a Physical Education System at London Junior Secondary School in Richmond. London School is comprised of grades eight to ten which is approximately eight hundred students. The Physical Education Department is composed of five P.E. teachers who have between two to five classes each. The school has its own Apple II computer which the P.E. teachers could utilize, if necessary, at certain times.

Presently, the teachers are using a manual system to evaluate the students on their performance in Physical Education. This method is plagued with several problems causing the teachers to do excess work.

Our project will initially describe the existing manual system including a data flow diagram which will be followed by an examination of the objectives then constraints of a P.E. Management System. We will then outline the problems inherent in the system as it is now,as well as an analysis of these problems. The available alternatives will be discussed next, with a description of our recommendations to follow.

EXISTING INFORMATION SYSTEM DATA FLOW DIAGRAM

	INPUTS	PROCESSES	OUTPUTS	USERS
1.	Class list-paper -from administration -names only	—	—	Teacher
2.	Activity signup forms	Generation of unit lists	Unit lists	Teacher
3.	Unit list, Skill level -verbally obtained from student	Generate activity sequence class lists	Activity sequence class lists	Teacher
4.	Unit list	Attendance and affective marks entered during unit	Updated unit list	Teacher
5.	Activity sequence class list	Skill achievements entered during unit	Updated activity sequence class list	Teacher
6.	Updated activity sequence class list, updated unit list	Transfer exit skill level onto unit list	Completed unit list	Teacher
7.	Completed unit list, class list	Transfer skill and cognitive levels and attendance and affective marks onto class list	Updated class list	Teacher
8.	Updated class list	Write report card	Report card	Teacher Administration Student Parents
9.	Updated class	Transfer skill and cognitive levels onto PR form	Updated PR form	—

EXISTING INFORMATION SYSTEM — NOTES TO DATA FLOW DIAGRAM

Steps 1-9 performed MANUALLY

Time Frame:	At start of school year	1
	Prior to start of new unit	2,3
	During each unit	4,5
	After completing each unit	6,7
	Before report cards issued	8
	End of school year	9

DESCRIPTION OF THE EXISTING SYSTEM

The existing information system used by the Physical Education teachers at London Junior Secondary School is shown in the systems chart. There are eight basic steps a teacher must go through to determine a student's final mark in Physical Education. These steps are described below.

Step One: After registration, the students' names are placed in classes according to the students' timetabling needs and grades. The teachers receive their class lists from the administration office at the beginning of each school year. There are two classes and two teachers per block.[1]

Step Two: During the first class of each unit[2], the students in both classes sign up for one of two activities[3] offered during that unit. The two different activities are taught by the two assigned teachers for a given P.E. block. The unit list (see exhibit 1) is compiled after the first class of each unit.

Step Three: The teacher finds out the level[4] previously attained by each student for a particular activity either by asking the student or by a screening method, such as observing the students performance during the first class of each unit. Each level for a particular activity has different skills which must be performed. Once the appropriate level has been determined, the student's name is copied from the unit list to one of

1) Block - This term refers to a specific P.E. class that occurs twice in one week. A specific P.E. block will always have the same students and teachers.
2) Unit - A term used to describe the time spent on an activity. A unit is usually about ten classes in length. There are from six to nine units taught during a school year. (Seven this year).
3) Activity - A general term used to describe the athletic event within one unit (e.g. basketball, volleyball, etc.). There is a choice of two activities for a given unit, each taught by a different teacher.
4) Level - This term refers to the skill level of a student. There are four levels (I, II, III, IV) with I being the level requiring the least amount of skill for a given activity.

the four corresponding Activity Sequence Class Lists, separated by levels (see exhibit 2). This level is also recorded on the unit list for each student.

Step Four: Throughout the rest of the unit, each student is evaluated on the basis of attendance, attitude, preparation for class, score on a written exam, as well as how well the student performs various skills related to the activity at a particular level. The skill data is recorded on the Activity Sequence Class List and the other data ia recorded on the Unit List. This process is complete at the end of a given unit.

Step Five: At the end of each unit an affective, a cognitive, and a skill mark must be calculated on the Unit List for each student to determine the unit grade. The affective score, worth thirty marks, is based on the students attendance, attitude and preparation for each class. The cognitive score, out of thirty marks, is based solely on the score attained on the written test for the unit. Finally, the skill score, worth forty marks, is based on the level the student achieved by the end of the unit. The total of these three components yields a mark out of one hundred which can be translated to a letter grade. The students Exit Level and Work Habits are recorded on the unit list as well. The Work Habits mark is a subjective evaluation assigned by the teacher choosing from outstanding, good, normal, and unsatisfactory (O, G, N, U).

Step Six: A copy of the unit list is exchanged between the two teachers of the same P.E. block and the teachers then transfer the marks of students in their class from the Unit List onto the Class List. This process completes a unit.

Step Seven: Each reporting period (during which one or more units may be completed) the teacher must calculate the overall P.E. mark for the students in their class. This is done by averaging each student's unit marks for

the reporting period and then recording this mark on the student's report card. At the end of the school year an overall P.E. mark is determined by calculating an average of the marks from the previous four reporting periods to arrive at a mark for the year.

Step Eight: At the end of the year the teachers must transfer their students' relevant information to the students' permanent record card (see Exhibit 3). The permanent record card is used to provide a record of each student's performance in Physical Education for the three years at London Junior Secondary School. It also provides the following P.E. teacher with some background information on the student.

OBJECTIVES OF A P.E. MANAGEMENT SYSTEM

The major function of the existing information system is to provide relevant evaluation information on each student. The information is processed by the current physical education teacher to determine the student's mark. It is then provided to the student and his parents to report on the student's current progress. The information is also required by the school administration for the student's permanent record. Although these preceding parties all require the information, perhaps the most beneficial use of the information is to provide the student's next physical education instructor with a complete record of the student's achievements to date. This is invaluable to this instructor for planning and evaluation purposes.

For the information to be of most value, it must be timely. Set dates for report card issuance necessitates that all information must be processed and provided on time. More importantly, a teacher must be provided with information concerning a student's past achievement in a particular activity prior to the onset of a new unit. This will provide for maximum use of all information in planning the student's participation and needs for the coming unit.

A desirable outcome of a complete information flow will be to minimize administrative functions for the Physical Education teacher. Hopefully, time taken to prepare class lists containing all relevant student information can be minimized. Redundancy in the form of endless transcribing of names and records from one list to another can be eliminated. This should maximize the time the teacher has available for his primary instructional duties.

As class time has also been used in the past for administrative matters, the information system should seek to minimize this in order to maximize instructional time.

CONSTRAINTS OF A P.E. MANAGEMENT SYSTEM

The implementation of any changes in an information system will be subject to constraints. The primary constraint for this system will be cost. While costs are always required to be minimized and justified by the benefits they provide, current economic conditions require that cost minimizations, particularly in the form of additional costs, be stringently applied.

Any introduction of a computer system would have to solely make use of the existing computer system, which consists of an Apple II computer with a disk drive. With this, there is the problem of limited access times. The Apple II computer terminals are currently being used during school hours for computer science classes and out of class time by students for their projects. Therefore, any data entry would have to be scheduled and may be limited to a set number of hours per week.

Labour costs and availability are also constraints. Therefore, any data entry should be done by existing staff. Due to past budget cuts, the school office has lost one secretary, resulting in the remaining secretaries having full workloads. It becomes apparent that any new method, whether it be manual, with the introduction of new record keeping methods, or computerized, with the requirement of data entry, will most likely have to be handled by the existing physical education teachers on staff. As a result of this, additional limiting factors become apparent. The limited technical knowledge of the physical education teachers will require a simple, easy to follow, user-oriented system. There will also be the potential for user resistance. In addition, the limited availabile time of the teachers, as referred to previously, will necessitate that any new system require minimal additional (and hopefully less) of the teachers' time.

PROBLEMS WITH THE EXISTING MANUAL PHYSICAL EDUCATION MANAGEMENT SYSTEM

From our interviews and observations of the system we have identified the following general problems:

1. Information on students' previous performance is difficult for the teachers to obtain, and not all of the desired information is available.
2. Class time is wasted i) at the end of each unit because students must spend time signing up for their next unit, and ii) at the beginning of each unit while teachers pre-screen students to determine their skill level.
3. The grading and record keeping processes involve a considerable amount of paper (forms) handling and results in redundancies in information recorded and in teacher time spent on administrative functions.

To be more specific, the first problem deals with the difficulty teachers have in obtaining information on a student's previously attained skill and cognitive levels in the particular activity which is going to be taught. Some of this information (an overall level assigned by the teacher who last evaluated the student in that particular activity) is recorded on the student's permanent P.E. record card, but it would be very time consuming for the teacher to access each student's permanent record and note the previous progress for each of the eight or so units conducted during a year. A further difficulty arises because permanent records are kept by the teacher whose class the student is registered in (the boys' P.E. teacher has a file containing his boys' permanent records and the girls' P.E. teacher has a similar file for her girls). Thus, when a unit is conducted a teacher would need certain records from the boys' file and certain records from the girls' file for those students registered for the unit he is about to begin.

The teachers simply do not have the time to spend accessing this information which they feel is currently of limited use anyway.

The second problem relates not only to a waste of class time but also to the teachers' own time. After students have selected their next activity, the teacher must then use this information to draft a new unit list before the next class. At the start of the new unit, the teacher then must use the better part of the first period to evaluate each student's entry skill level, and from this the teacher catagorizes each student into one of four different skill levels so that progress during the unit can be noted. Throughout this process no instruction can take place. This wasted time is not insignificant when one considers that during the course of a school year up to nine units are covered in a P.E. class.

The third problem relates to the fact that for each unit the teacher will handle up to five different evaluation forms and be required to update each student's permanent record form. Also, four times per year the teacher must complete a report card for each student. There are certain redundancies in the system of both information and teacher effort, and in some cases wastes in that information is accumulated and recorded but is not passed on to be used.

ANALYSIS OF THE PROBLEMS

The problems identified have arisen mainly because of the desire by teachers to give more attention to individual student needs and progress. For this to be possible, the quantity of data to be kept on each student has increased and as a result the administrative tasks have also increased.

In analyzing the first problem we found that part of the problem is due to the fact that the information desired is not recorded or stored by any teacher in a form which would be useful to the next instructor. Currently only a 'level' is assigned and recorded on the student's permanent record card, whereas the next instructor in that activity would like to know both the student's skill and cognitive levels.

The second problem appears to result from a lack of preliminary planning and organization. Information which is being conveyed by the students on numerous occasions throughout the year could be obtained all at one time at the beginning of the year, and also processed (i.e. unit lists generated) at one time. A possible solution to this problem will be discussed later.

The third problem is a direct result of the increased amount of information being recorded and used by the teachers for evaluation and instruction. It is also a result of the large variety of activities on which students are being evaluated. Given that teachers want and can make use of all the student data currently being recorded and stored, an improvement could only come from improved form design, filing methods, and information retrieval procedures.

ALTERNATIVES

Given the above problems and analysis, there are five alternatives available from which to choose in order to aid in solving the difficulties outlined previously. They are: 1) Status Quo, 2) Improvement of the Manual System, 3) Implementation of a Computer System, with Improvement of the Manual System, 4) Computer System with Computational Capabilities, and 5) The Ideal System. These alternatives will be discussed in the following sections outlining the advantages and disadvantages of each. Following, will be our recommendations as to the most optimal solution to the inherent problems facing the Physical Education Department at London Junior Secondary School.

1) Status Quo

The most apparent advantage to the Status Quo alternative is its ease of implementation. There would be no changes required as it implies leaving the system to operate as it is at the present time. Given that the education system is faced with severe budget cutbacks, this alternative is also attractive in that it requires no extra cost. Further, it does not require the redefinement of the teachers job description along with additional training, as would any new system. Therefore, in this respect it is also an advantage.

The obvious disadvantage to the Status Quo alternative is its inability to solve the problems that are plaguing the Physical Education Department. Some revision of the existing system is necessary in order to alleviate the redundancy of the work, the wastage of class time, and the difficulty of obtaining past information on each student.

2) Improvement of the Manual System

This alternative would involve redesigning the forms the teachers are presently using to reduce the repetition of the tasks. If this alternative is chosen,

it may mean the consolidation of some of the forms to mitigate the redundancy and lessen the time required by the teachers. As another recommendation for this alternative, it would be beneficial to centralize the files as they are difficult to access because they are in two separate locations at present. The files on the students should be sorted by grade and then classes within each grade. This would solve the problem of the teachers having to pre-screen the students during the first class of each unit as they would be able to easily access these files to find out the students' previous level on the unit.

In addition to these suggestions, the students should sign up at the begining of each year for all the nine units so that lists can be compiled as soon as possible. This would alleviate the problem of wasted class time at the begining of each unit.

The major disadvantage inherent in this alternative is the fact that the teacher must look up the students in a file to find out their previous level on an activity. This is a lot of work for the teacher to undertake when he may have five classes at once and he would have to copy the level for each student onto his current files. It would be more advantageous to have a list automatically generated. Also this alternative may not eliminate the large amount of copying and recopying the teacher is doing at present.

Therefore, since this alternative does not completely eliminate all of the problems we will now consider the third alternative.

3) Implementation of a Computer System, with Improvement of the Manual System

This alternative would involve the same revisions as previously mentioned with some additions. The forms would have to be designed so as to accommodate ease of data entry.

The computer would be a significant improvement over the manual system as Unit Lists could be generated that would provide the P.E. teacher with all the

information he requires regarding skill and cognitive levels from previous units. The teacher would not have to pre-screen the students or access paper files. Instead, Unit Lists could be requested from the files set up on the computer at the beginning of the year. This necessitates the students signing up for all their activities in September. This would require minimum effort and would reduce wasted class time. In addition, the computer system would mean that the information would be centralized and easy to access. The "run" commands should be provided to the user in a manual as he is likely to forget them due to his limited use of them.

The advantage to this alternative is that it solves the three main problems previously discussed.

A major disadvantage that becomes apparent when implementing any computer system is the possibility of user resistance. This alternative requires the teacher to enter the information regarding the students' chosen units at the start of the year as well as their respective skill and cognitive levels they achieve at the end of the year. The users will have to be trained on the terminal to facilitate in their acceptance of the new system. In the case of a refusal of the teachers to do the data input, it may be necessary to hire a data entry clerk, and the excessive cost could make this expenditure prohibitive.

4) Computer System with Computational Capabilities

Along with the improvements suggested in the third alternative, this system would have the ability to calculate the students' grade marks from the inputted information regarding affective, cognitive, and skill levels. It would require another program on the system that would add these three marks to yield a total out of one hundred, which would then translate this into a letter grade. This grade mark is input to the students' report cards and is required by the teacher only for record keeping purposes.

The advantage here is that it lessens the teachers' workloads even further, in that they would not have to calculate this mark manually.

Given that this is not a difficult calculation, it may not be necessary for the system to have this capability. It may only add to the cost and complexity of a system that should be designed to simplify the existing workload at a minimum cost.

5) The Ideal System

In outling alternatives in a given situation, the ideal system should always be discussed. In our case the ideal system would be one where the information could be accessed by the users in any format, at any time. The backup to this data would be stored off-line on another disk, therefore eliminating the need for any paper files. Also this system would have a data entry clerk who would handle all of the work on the terminal, thereby mitigating the teachers' workload.

In addition, the class and unit lists would be generated automatically at certain pre-specified times of the year, thereby eliminating the necessity of the teachers requesting this information. Also the teacher should only have to generate manually the marks for the affective, cognitive, and skill levels, as well as the work habits. The other marks would be computed by a program on the computer. Again, this system would be centralized facilitating the ease of access. It would virtually eliminate the excess paper work and class time wastage.

The most apparent disadvantage to the ideal system is that it is an "all-or-nothing" system. Any system breakdown would pull all the aspects of the P.E. record keeping system down. Therefore there is a risk of a stoppage of the information flow. In addition, the cost of such an elaborate system would most likely be out of the range of the education budget that the school would be alotted.

RECOMMENDATIONS

Based on the problems with the existing manual system, we feel that a computer could eliminate some of the problems. However, there will be a tradeoff between reducing wasted class time and increasing out of class administrative time. With this in mind, it will be ultimately up to the users to determine if the benefits outweigh the costs.

The functions of the recommended computer system will be to make the students' previous cognitive and skill level information more easily obtainable, as well as to eliminate the manual method of drafting class lists. For the most part, however, we do not feel that the existing manual system should be changed, with the exception that students should sign up at the beginning of a year or term for their desired activities directly onto a permanent record form. These permanent record forms will be used by the teacher by providing some of the necessary input information for the computer system. The system will work as follows:

Each teacher, having obtained from each student a completed permanent record form listing the chosen activities, will create a class file on a disk with each record consisting of the student's name and chosen activities, allowing space in each record for the skill and cognitive levels attained during the coming year. For each block, there will have been created two class files: one by each teacher in that block. In order to create unit lists, the two class lists for a given block are merged and sorted by activity by running a program designed to perform this function. At this stage there is no output, but unit lists for each activity, containing student names only, will have been created and stored internally. With this function completed, a program which accesses each student's permanent student progress

file will retrieve information from this file relating to the most recent achievement levels in the chosen activities and combine this information with the unit lists. These unit lists will be output and contain each student's name and previous cognitive and skill level information. These paper unit lists will be utilized in much the same manner as they are utilized in the current manual system.

At the end of a year or term a teacher uses the information on the permanent record forms which contain the students' achievements in each activity for the entire year or term, and enters onto his class list disk the cognitive and skill levels achieved by each student in each activity. With this information now stored on the class list disk, a program is run which uses this information to update the students' permanent student progress file. Each teacher's class disk can then be erased and re-used in the following year or term to repeat the procedure. The permanent student progress file, which contains records and space for up to twenty activities for each student in the school will be kept in a central location, and be backed up by a duplicate permanent student progress record disk which will be updated once a year or term. A data flow diagram is provided.

In order to create a permanent student progress record for incoming grade eight students, the instructor would simply run a program which would transfer the information from the completed class lists onto the permanent student progress disk, with the program being designed so that enough empty space is available per student record on the permanent student progress disk for later years' activity information to be stored. Since the updating run of the permanent student progress disk does not have to be particularly time efficient (it can be done at any time between the end of one school year and the beginning of the next) the permanent student progress file can be organized in any fashion. Also, since it should not be necessary to access the permanent student progress information at any time during the school year,

record search and retrieval time is not a particularly important consideration with this system.

The recommended procedures to be followed in order for this system to work are:

1. Each teacher be given a floppy disk on which class list information can be stored. The teacher will key in each student's name and his activity choices (in abbreviated forms) for the year in a format similar to the following:

Abbott, John	bb,vb,ten,soc,sof,...
Brown., Jim	bb,vb,bad,lac,sof,...
Cooper, Dave	ff,hb,bad,soc,sof,...

This information will be stored on the disk. A complete class list with this information will constitute a single file on the disk. A teacher may have more than one file per disk, so each file should be identified by the P.E. block letter to which the class refers.

2. Once each class list is completed, the teachers of common P.E. blocks must get together and have their class lists run with the Unit List Generating program, from which they will receive (as the printout of the unit list generating program) their completed unit lists according to activity, for the entire year in the format design shown by Exhibit 6.

This is the extent to which the teacher would be required to operate or have access to the computer for the entire school year.

3. At the end of the school year the teacher would take his class list disk and key in the cognitive and skill level information on each student (by referencing their paper permanent record) for each acitivity for the year onto his class disk (this information would be appended to each record). The Permanent Student Progress Updating program is run using the information from this updated class list against the permanent student progress disk, which will have to be obtained from its secured storage location. The time required

by the teacher in the unit list creation stage we estimate to be a maximum of one hour per class and the same amount of time at the end of year unit list/ permanent student progress updating stage.

RECOMMENDED INFORMATION SYSTEM DATA FLOW DIAGRAM

	INPUTS	PROCESSES	OUTPUTS	USERS
1.	Class list-paper -from administration -names only	—	—	Teacher
2.	Student activity choices for entire year -from PR cards -input by block	Activity choices for a common block merged according to similar activity choice	Unit lists -stored only with no physical output	—
3.	Cognitive and skill levels -from permanent student progress file	Add cognitive and skill levels to unit lists	Unit lists-paper -contain names and cognitive and skill levels	Teacher
4.	Unit list	Names sorted by skill level to form activity sequence class lists	Activity sequence class lists	Teacher
5.	Unit list	Attendance and affective marks entered during unit	Updated unit list	Teacher
6.	Activity sequence class list	Skill achievements entered during unit	Updated activity sequence class list	Teacher
7.	Updated activity sequence class list, updated unit list	Transfer exit skill level onto unit list	Completed unit list	Teacher
8.	Completed unit lists, PR form	Transfer skill and cognitive level onto PR form	Updated PR form	Teacher
9.	Updated PR form	Write report card	Report card	Teacher Administration Parents Student
10.	Updated PR form, permanent student progress file	Add current/cards' skill — cognitive level for each activity	Updated permanent student progress file	—

RECOMMENDED INFORMATION SYSTEM — NOTES TO DATA FLOW DIAGRAM

Steps 1, 4-9 performed MANUALLY

Steps 2,3,10 performed by COMPUTER

Time Frame:	At start of school year	1-3
	Prior to start of new unit	4
	During each unit	5,6
	After completing each unit	7,8
	Before report cards issued	9
	End of school year	10

FORM DESIGN REVISION

Other than the use of the computer for the generation of Unit Lists, the manual system will remain unchanged. However, we have redesigned some of the forms used for the record keeping and mark generation procedures.

The forms the Physical Education Department is presently using are the Permanent P.E. Record Card, a Class List, a Unit List, an Activity Sequence Class List, and the Report Cards. Each will be discussed and the changes we recommend demonstrated where necessary.

It is essential that the Permanent P.E. Record Card be redesigned to accomodate the teachers' requests. This would require adding the specific levels that the teacher uses (affective, cognitive, and skill) as well as the entry levels (previous levels attained) and Exit Levels (levels achieved in the unit this year). See exhibits 3 and 4 for examples of the old and new forms. Each grade would necessitate a new form to be stapled on top of the previous form so that all the information can be accessed at one time. The forms should be sturdy cardboard material so that they will last the four years that the student is required to take Physical Education.

The Class List is given by the Administration Office and therefore there are no changes that we are able to suggest.

Thirdly, there are improvements that can be made to the existing Unit List similar to those made to the Permanent P.E. Record Card. See exhibits 1 and 5 for examples of the old and new forms. We would add the specific levels (skill and cognitive) to the Entry and Exit Levels to facilitate more accurate informational records. The Exit Level columns should be moved to the right of the Unit Marks as the Exit Level is a result of the marks achieved on the various levels during the unit.

We would make no changes to the Activity Sequence Class List as these skill

are the criteria that the teachers use when observing and grading the students. The teachers are satisfied that this form is useful to them. See Exhibit 2 for a sample of this form.

Finally, the teachers use the report cards on each student. We have not seen a copy of their existing report card form but can only make suggestions as to what would be beneficial to appear on this form. Along with the relevant information regarding the student, there should be a list of each activity taken by the student during this reporting period with its corresponding mark. Also, the overall term mark should appear. There is no need to include the various levels attained by a student as this mark has relevance only to the teacher and may confuse the students' parents. Finally, with respect to the P.E. mark, an indication of the students work habits should be included (O, G, N, U) with any additional comments the teacher may wish to make regarding the students performance in Physical Education.

Exhibit 1

NAME	LEVEL	ATTENDANCE	LEVEL	APP	CCG	SKL	TOT	GRD	MI

ACTIVITY SEQUENCE CLASS LIST

EXHIBIT 2

SS: _____

CK: _____

BASKETBALL

EL: 2 →

	SKILLS																
	SPEED DRIBBLE	WEAK SIDE BAY-	NO DRIBBLE	FREE THROW	JUMP SHOT	FAKING WITH BAL	FAKING WITHOUT BA	JAB STEP	MAN TO MAN	SCREEN - 2 ON 2							

Exhibit 3

CHARLES E. LONDON JR. SECONDARY
PERMANENT P.E. RECORD CARD

NAME: _____ SEX: _____ CLASS _____

BLOCK _____ _____ _____ _____

BIRTHDAY: _____ HOME PHONE: _____

P.E. 8: Year ____ Final Grade _____ P.E. 10: Year _____ Final Grade _____

P.E. 9: Year ____ Final Grade _____ P.E. 11: Year _____ Final Grade _____

Interim Reports:

Date	Date	Date	Date

ACTIVITIES:	GRADE 8			GRADE 9			GRADE 10			GRADE 11		
	lev.	gr.	comment	lev.	gr.	comment	lev.	gr.	comment	lev.	gr.	comment
TEAM												
- basketball												
- field hockey												
- flag football												
- lacrosse												
- rugby												
- soccer												
- softball												
- team handball												
- volleyball												
-												
-												
INDIVIDUAL & DUAL												
- badminton												
- tennis												
- track & field												
- wrestling												
-												
-												
GYMNASTICS												
- artistic												
- rhythmic												
- trampoline												
DANCE												
- folk												
- social												
- square												
AQUATICS												
- swimming												
ACTIVE HEALTH												
- fitness												
- flexibility												
- nutrition												
- posture												
OUTDOOR PURSUITS												
- orienteering												
-												
-												

Exhibit 4

CHARLES E. LONDON JR. SECONDARY

PERMANENT P.E. RECORD CARD

NAME: _____

SEX: _____

BIRTHDAY: _____

HOME PHONE: _____

GRADE: _____

BLOCK: _____

TEACHER: _____

FINAL MARK: _____

INTERIM REPORTS: Date: 1) _____ Mark: _____

2) _____ Mark: _____

3) _____ Mark: _____

4) _____ Mark: _____

ACTIVITIES	ENTRY LEVEL		PRESENT UNITS MARKS				EXIT LEVEL		MARK	WORK HABITS
	Skill	Cog.	Aff.	Cog.	Skill	Total(100)	Skill	Cog.		
1)										
2)										
3)										
4)										
5)										
6)										
7)										
8)										
9)										

Exhibit 5

CHARLES E. LONDON JR. SECONDARY

PHYSICAL EDUCATION DEPARTMENT

UNIT LIST

UNIT: _____

BLOCK: _____

TEACHER: _____

NAME	ENTRY LVL		ATTENDANCE										UNIT MARKS				EXIT LVL		MARK	W/
	Skl	Cog											Aff	Cog	Skl	Tot	Skl	Cog		
1.																				
2.																				
3.																				
4.																				
5.																				
6.																				
7.																				
8.																				
9.																				
10.																				
11.																				
12.																				
13.																				
14.																				
15.																				
16.																				
17.																				
18.																				
19.																				
20.																				
21.																				
22.																				
23.																				
24.																				
25.																				

APPENDIX C

PEMS DOCUMENTATION

Physical Education Management System

a record keeping system for P.E. teachers

PHYSICAL EDUCATION MANAGEMENT SYSTEM - P.E.M.S.

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PROJECT CREDITS:

This project was funded by a grant from the Educational Research Institute of British Columbia.

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Programming and documentation: William Trembath

Original Concept: Bob Corbett, formerly at C.E. London School

Test School: Charles E. London Junior High School of Richmond

Project coordinator at London: Gary McBride

Special thanks must go to Bob Corbett, who did so much of the initial groundwork, and to all the P.E. teachers at London, who have given so freely of their time.

Physical Education Management System - P.E.M.S.

A. GENERAL

1. PURPOSE OF THE SYSTEM

This system is designed to allow P.E. teachers to easily keep track of students' marks. These marks consist of the fitness level, cognitive level, and overall grade achieved in each individual unit of the B.C. Physical Education curriculum, with the option of recording report card marks as well.

Many B.C. schools already keep such records manually in the form of P.E. Permanent Record cards. The major disadvantages of the manual system are:

1) marks must be copied from class lists to the Permanent Record cards, which is very time consuming and inevitably results in errors of transcription.
2) PR cards do not store data in a form that is easily accessible to the teacher for the purpose of instruction.

Computers can manipulate data quickly and easily, thus saving teachers time and enabling them access to information whose collection would have been prohibitively time-consuming under the manual system. Some of the things P.E.M.S. does are:

1) generate class lists with spaces for attendance and marks at the beginning of each unit. These lists include the marks received by each student the last time they took that particular unit. This information is invaluable to the teacher for planning and individualising instruction.
2) save class marks in a temporary file, and transfer them to the permanent file at the push of a button.
3) generate a list of the names, homerooms, and sex of all the students in a given grade, 100 students per page.
4) gives the teacher instant electronic acces to the Permanent Records of all the students in a school. PR cards may be printed out as well.

2. FUTURE ADDITIONS TO P.E.M.S.

The system will include, when complete, a program that will allow the individual teacher to enter report card marks using a system similar to that used in the CLASS LIST program. This program will be developed after the existing MASTER and CLASS LIST programs have been field-tested and new insights gained by users and the development staff.

3. SCHEMATIC DIAGRAM OF THE SYSTEM

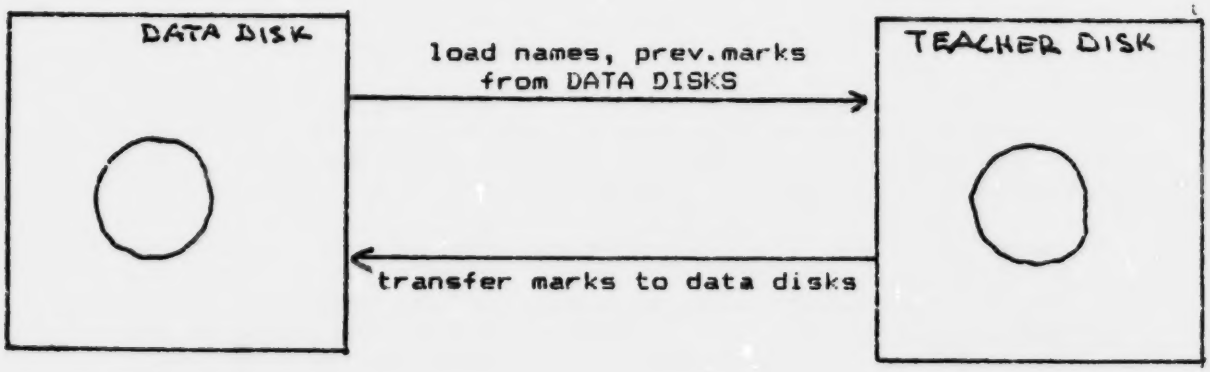
A. PHYSICAL COMPONENTS OF P.E.M.S.

MAIN DATA DISKS-1 per grade

-each DATA DISK contains a file and a program. The file is a list of the names and marks of all the pupils in the grade. The program, called the MASTER program, is used to access the file.

TEACHER disks-1 per teacher

-each TEACHER disk contains one teacher's class files and a program, called the CLASS LIST program, that creates and works with the class files. A class file is a list of the names, previous marks, and current marks of the students in a given curriculum unit.



B. PROGRAMS - main functions listed

MASTER - works with DATA DISKS	CLASS LIST - works with class files
1) add, drop students from MAIN DATA DISKS	1) create class files
2) edit or view on screen individual stud. records	2) print out class lists with spaces for attendance and marks
3) print out Permanent Rec. cards singly or in bulk	3) enter unit marks
4) print out a list of all students on a disk	4) transfer marks to MAIN DATA DISKS.
5) initialise new DATA DISKS	5) delete class file when the teacher no longer needs it

4. INFORMATION STORED BY P.E.M.S.

P.E.M.S. stores three sets of data for each student

Name Data: student's name, homeroom, and sex.

Report Card Data: report card marks for Grades 8 to 11. There is space to record up to five report cards per year. Not all schools may wish to use this feature of the program.

Unit Score Data: three marks are recorded for each activity unit taken by the student; the fitness level, the cognitive level; i.e the written test result; and the overall grade.

The possible marks are
1) fitness level: 3+, 3, 3-, 2+, 2, 2-, 1+, 1, 1-
2) cognitive level: 0, 1, 2, 3
3) overall grade: A, B, C+, C, C-, P, F, I

It is assumed that there are three different levels of cognitive testing. What is stored is the highest level test that the student has passed. For example, if a student wrote a level 1 test and passed it he would receive a cognitive score of 1. If he had failed the test he would have received a score of 0, indicating that he has not passed the lowest level test. Students will not be allowed to take level 2 or 3 tests until they have passed the level below.

The following is a P.E. Permanent Record card that shows all the data stored for a particular student.

PERMANENT RECORD FORM

11041 ROBINSON; ANNE F 12

UNIT SCORES

REPORT CARD MARKS	UNIT	GRADE 8 SL	GRADE 8 GD	GRADE 8 CL	GRADE 9 SL	GRADE 9 GD	GRADE 9 CL	GRADE 10 SL	GRADE 10 GD	GRADE 10 CL	GRADE 11 SL	GRADE 11 GD	GRADE 11 CL
	ACTIVE HEA				2	A	1	2+	A	2	2+	B	2
	AQUATICS												
	BADMINTON	1	C	0	1+	B	1	2	B	2			
(8) C+ B C+ C C+	BASKETBALL	1-	C+	1	1	C	1	1+	B	2	2	C+	2
	DANCE												
(9) B C C- C C	FIELD HOCK				1-	C-	0	1	C	1	1+	C+	1
	FLAG FOOTB												
(10) C+ B B A B	GYMNASTICS				1	C+	1				1	C	1
	LACROSSE												
(11) B C+ C+ C C+	OUTDOOR ED												
	RUGBY	1-	C+	1							1-	C	1
	SOFTBALL	1	B	1	1+	C	1	1+	B	2	1	C+	3
	SOCCER	1-	C+	1	1	C-	1	1	B	2	1	C+	3
	TEAM HANDB												
	TENNIS	1	B	1				2	A	1			
	TRACK/FIEL	1	C+	0	1	C	1				1	C	2
	VOLLEYBALL	1	C	0									
	WRESTLING							1-	B	1			
	SPECIAL PR												

6. HINTS TO USERS

a) When you type something into the computer it is usually necessary to press the RETURN key to let the computer know that you have finished typing.

b) P.E.M.S. is menu-driven. What this means is that you indicate what you want to do to the computer by choosing from a numbered list of options.

c) Once you have chosen an option; e.g. entering marks; how do you get back to the menu if you decide that you would rather do something else first? All through the P.E.M.S. programs there are places where the computer gives you the option to return to a menu, usually by typing *M or M. As well, the menus all give you the option to quit the program by typing *Q.

d) The last thing that happens when entering new data or editing old data is that the computer will ask you if you want to store what you have entered onto the disk. If you reply in the affirmative the data will be duly stored on the disk (i.e. in permanent memory), otherwise it will leave things as they were, so all your new entries will be cancelled. You thus have explicit control over what is stored on your disk. you should consequently be careful not to exit a routine before you have stored what you want.

e) Please do not enter commas when entering marks, names, or any other sort of input. Due to a technical peculiarity of the Apple II computer entering a comma will cause the machine to misinterpret your data, and most probably give you this response: ??EXTRA IGNORED. If this should happen ignore it and carry on, as you will very likely have only confused the computer momentarily.

f) Do not press the RESET or CONTROL keys, which are located on either side of the keyboard. Pressing RESET may cause the computer to abort execution.

1. BRIEF DESCRIPTION OF THE CLASS LIST PROGRAM

Each teacher has his own, personal disk that has on it a program called CLASS LIST. The major functions of this program are to generate class lists, enter marks, and transfer the marks onto the DATA DISKS at the end of the unit.

The marks recorded for each student are the fitness and cognitive levels and overall grade achieved.

In brief, the sequence of operations is thus:

1) The students sign up for the unit. This may be done at the beginning of each unit, or alternatively for all the units at the beginning of the year.

2) The teacher uses his TEACHER disk to create a class file. This is done by inserting the appropriate DATA DISK and then entering the student numbers of the students in his unit into the computer. The students' names and previous scores are automatically read in. The TEACHER disk is then reinserted into the disk drive and the data is copied onto it. The CLASS RECORD FORM, a printed list of the students' names and old marks, with spaces for recording attendance and new marks may now be generated.

3) Attendance and marks are recorded on the CLASS RECORD FORM.

4) When the unit is complete and all the marks have been recorded the cognitive, fitness, and overall marks are entered onto the teacher's own disk. The marks can be edited on the computer at any time.

5) When the teacher is satisfied that all the marks have been entered correctly he uses his disk to transfer the marks onto the approriate DATA DISK(S). The FINAL MARKS FORM, which is a printed list of the students' old and new marks, may be generated either as a paper record or to be posted for the students.

6) The capacity of a TEACHER disk is a maximum of 32 class files per semester, for a total of 45 to 60 class files, depending on the size of te class files. The teacher may delete files at any time if more space is needed, or simply in order to dispose of unwanted information.

2. How to Find Your Way Around the Program

The program is largely self-explanatory, however there will be times when the user will need direction.

The program is divided into sections according to the function of each section. These sections are linked together by MENUS (see Hints to Users for a description of menus). Each section is further divided into a series of screens (i.e. what you see on the screen at a given moment). The screens have been numbered and listed in the order that they are displayed so the user can easily see where he or she is at any given time. The most important screens from the file creation section have been reproduced and explained in detail so as to make completely clear the operation of this sample section of the program. In addition there are flowcharts that show diagrammatically the connections between the various sections of the program

NOTE: there are many places in the program where it is possible to exit the section you are in and go to a menu, or even quit the program altogether. The screens where this is possible are marked on the flowcharts and screen lists with *M for MENU and *Q for QUIT.

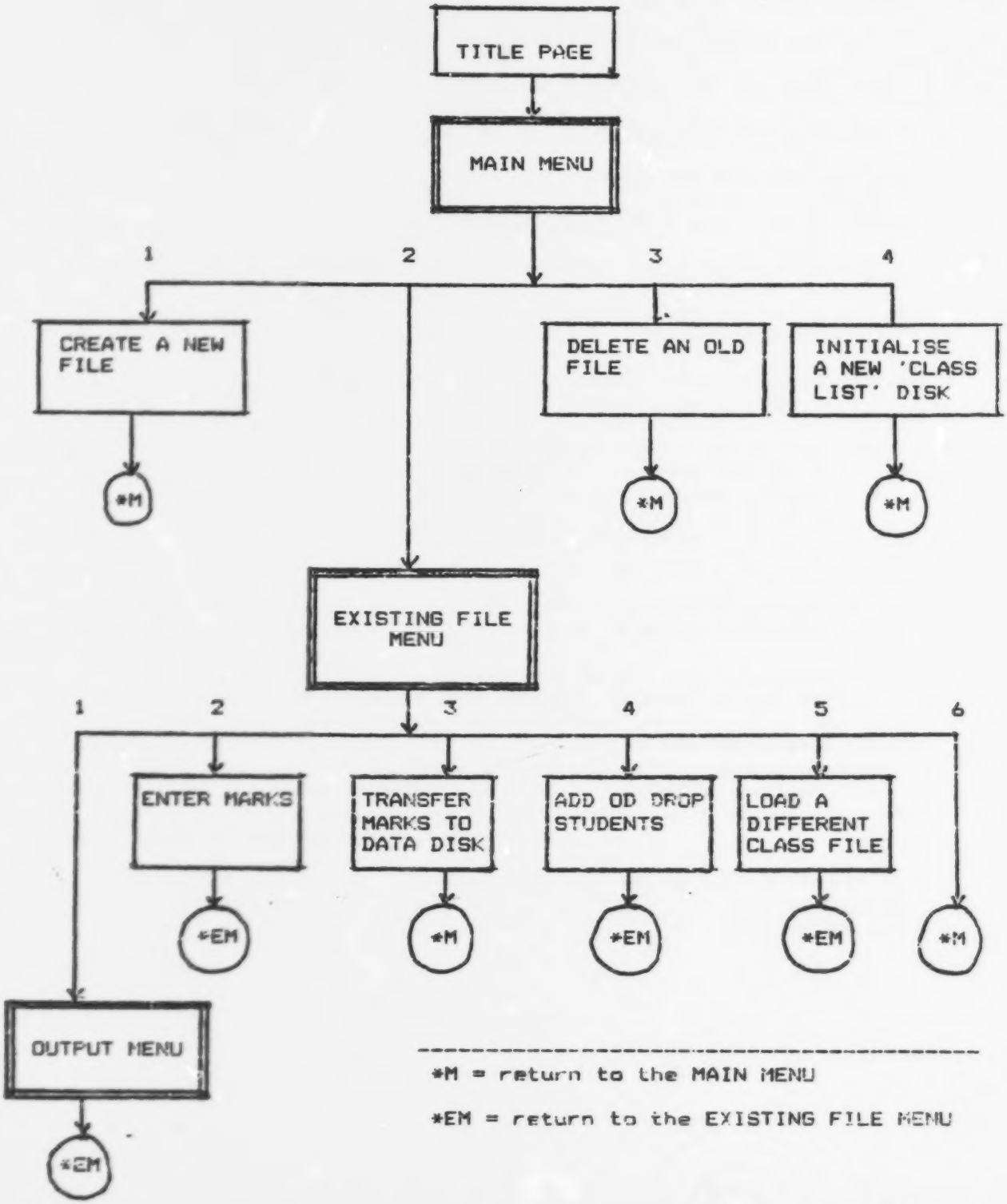
SCREEN NUMBERING SYSTEM

As you can see from an examination of the flow chart on the next page the various sections of the program are linked by MENUS. The sections and the individual screens are numbered according to the MENUS used to get to them. For example the MAIN MENU leads to the four main sections; 1) CREATE A NEW FILE; 2) LOOK AT OR WORK WITH AN EXISTING FILE; 3) DELETE AN OLD FILE; AND 4) INITIALISE A NEW TEACHER DISK. The screens in the file creation section are thus numbered 1.01 to 1.12. The add/drop a student section is reached by selecting 2 from the MAIN MENU and then, after reading in the file, selecting 4 from the EXISTING FILE MENU. The screens in this section are numbered 2.411 to 2.431. The first digit, 2, indicates the number chosen from the MAIN MENU, and the second digit, 4, indictes that it was the fourth option available from the EXISTING FILE MENU.

HEADINGS

Each section has a heading that appears in the top right corner of all the screens in the section. This heading is identified in the documentation for that section.

3. CLASS LIST FLOW CHART



4. HOW TO CREATE A NEW CLASS FILE

SCREEN LIST

1.01 How files are created (description)

1.02 Specify the unit (e.g. RUGBY) *M

1.03 Specify the semester (1 or 2)

1.04 Complete the class file name

1.05 Insert the MAIN DATA disk

1.06 Option to check student numbers

1.071 Enter student numbers-data is loaded when *F is typed *M

1.072 Display the names of any inactive or deleted students

1.08 Option to enter students from a second grade. If yes then repeat screens 1.05 to 1.071

1.09 Take out MAIN DATA disk. Reinsert your own.

1.10 Reminder that students may be added to or deleted from the file

1.11 Displays the names and previous marks of the students in the file

1.12 Press RETURN to save the file or press the SPACE BAR to cancel the whole thing

If the file was saved the program will go to the EXISTING FILE MENU. If the file was cancelled then the program will return to the MAIN MENU.

File Creation Procedure

The screen list outlines clearly the sequence of actions involved in creating a new class file. The most important screen are reproduced and explained below:

1.02 SPECIFY THE UNIT

Program name → PEMS - CLASS LIST PROGRAM

Section Heading → C. MACKINTOSH 82-83 CREATE A NEW FILE

Teacher name →

```
==========================================

SPECIFY THE UNIT

#  UNIT            #  UNIT
-  ----            -  ----
0  ACTIVE NE       10 RUGBY
1  AQUATICS        11 SOFTBALL
2  BADMINTON       12 SOCCER
3  BASKETBAL       13 TEAM HAND
4  DANCE           14 TENNIS
5  FIELD HOC       15 TRACK\FIE
6  FLAG FOOT       16 VOLLEYBAL
7  GYMNASTIC       17 WRESTLING
8  LACROSE         18 SPECIAL P
9  OUTDOOR E

ENTER THE NUMBER OF THE UNIT(0-18):?_
OR TYPE *M TO RETURN TO THE MENU
```

} Prompt Area

The program expects you to specify the unit by typing in its NUMBER. If you type *M instead you will be returned to the MAIN MENU.

TITLE AREA and PROMPT AREA: the top four lines of the screen list the program name and the teacher name on the left, and the program section and subsection on the right. In this case there is no subsection. When a class file has been loaded into the computer the filename appears below the teacher's name on the left. Hints and instructions to the user usually appear in the PROMPT AREA at the bottom of the screen.

1.04 COMPLETE THE CLASS FILE NAME

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH  82-83   CREATE A NEW FILE

*************************************

NAME THE FILE

UNIT = DANCE            SEMESTER 1

THE FILENAME CONSISTS OF THE NAME OF THE
UNIT PLUS A PART THAT YOU ENTER.

EXAMPLE FILENAME: RUGBY.MAY B-1

YOU SHOULD INCLUDE THE NAME OF THE BLOCK
IN THE FILENAME, AS IN THE EXAMPLE ABOVE


          PRESS RETURN TO CONTINUE
```

The name of the unit; e.g. BADMINTON; is automatically part of the class file name. You complete the namaby adding one to seven characters. For technical reasons none of these may be commas. It is strongly recommended that you include the name of the block in the file name; e.g. TENNIS.C-2. You must add at least one character to the name of the unit.

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH          CREATE A NEW FILE

*************************************

NAME THE FILE

UNIT = DANCE            SEMESTER 1

THE FILE NAME CONSISTS OF THE NAME OF
THE UNIT PLUS A PART THAT YOU ENTER.

EXAMPLE FILENAME: RUGBY.MAY B-1

-------------------------------------

COMPLETE THE FILENAME WITH UP TO 7
CHARACTERS OF YOUR CHOICE

                        1234567
FILENAME = DANCE +?
```

1.05 INSERT THE MAIN DATA DISK

```
Class                PEMS - CLASS LIST PROGRAM
Filename ---->       C. MACKINTOSH  62-03   CREATE A NEW FILE
                     DANCE. D-2
                     ==========================================
                        MAIN DATA DISK SHOULD BE IN DRIVE



                     NOW INSERT THE MAIN DATA DISK

                     (I.E. THE GR. 8,9,10 OR 11 DISK)


                     PRESS RETURN TO CONTINUE, OR
                     TYPE M TO RETURN TO THE MAIN MENU
```

After the class file has been named the students in the class are identified. Their names and the marks they received the last time they took this particular unit will be read in from the MAIN DATA disks.

Take out your own TEACHER disk, insert the appropriate MAIN DATA DISK and press RETURN. You may instead abort this routine and go back to the MAIN MENU by pressing M instead.

This process will be repeated if there is more than one grade in your class. There may be up to two grades in one class file.

1.06 TYPE C TO CHECK STUDENT NAMES AS YOU ENTER THEM

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH          CREATE A NEW FILE
DANCE. D-2
=========================================
   MAIN DATA DISK SHOULD BE IN DRIVE
>>> GRADE9    268 STUDENTS ON RECORD <<<

-TYPE C TO CHECK THE STUDENTS' NAMES AS
 YOU ENTER
 THEM

-PRESS RETURN TO AVOID THIS
 (CHECKING NAMES TAKES MORE TIME) _
```

The students in the file are specified by typing in their student numbers. Usually all the numbers are typed in and the names; etc. then read in from the MAIN DATA disks. You may, however, choose to read in and verify each student's name as the numbers are typed in. This method is surer but takes longer. You may switch back and forth between these two modes while typing in the numbers by simply typing C, for check, or NC, for no check instead of typing in a student number.

1.071 ENTER STUDENT NUMBERS

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH  82-83   CREATE A NEW FILE
DANCE. D-2
=========================================
   MAIN DATA DISK SHOULD BE IN DRIVE
>>> GRADE 9   268 STUDENTS ON RECORD <<<

-----------------------------------------

ENTER ST# OR                    ?_
 #F = FINISHED
 #M = RETURN TO THE MAIN MENU
 C = CHECK NAME    NC = CANCEL CHECK
```

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH
DANCE. D-2
=========================================
   MAIN DATA DISK SHOULD BE IN DRIVE
>>> GRADE9    268 STUDENTS ON RECORD <<<

   9002  9028   9116
   9003  9029   9117
   9004  9030   9130
   9005  9031   9140
   9010  9100   9141
   9011  9110
   9020  9112
   9021  9113
   9023  9114
   9024  9115
-----------------------------------------

9200 ST DENIS;HUGHIE   M  23

RETURN = CONTINUE
X = WRONG STUDENT- TRY AGAIN _
```

1.072 LIST OF STUDENTS WHOSE DATA COULD NOT BE LOADED

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH  82-83   CREATE A NEW FILE
DANCE. B-2
=========================================

THE FOLLOWING STUDENTS' FILES COULD NOT
BE LOADED BECAUSE THEIR FILES ARE EITHER
INACTIVE OR HAVE BEEN DELETED

    9002


                PRESS RETURN TO CONTINUE_
```

The program will not read in deleted or inactive student files. The status of a student's file, which may be either active, inactive, or deleted may be only be changed with the MASTER program. If a student's file cannot be read in because it is not active you should check with the person in charge of the P.E.M.S system to see why the file is not active

1.12 SAVE THE FILE ONTO YOUR OWN TEACHER DISK

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH  82-83   CREATE A NEW FILE
DANCE. B-2
=========================================


-PRESS RETURN TO PUT THE NEW FILE ON
 YOUR DISK, OR

-PRESS THE SPACE BAR TO CANCEL THE WHOLE
 THING _
```

At this point the class file has been created and named, and the students in it read in. All this data resides in the computer's memory, which is wiped clean when the computer is turned off. In order to save it onto your disk press RETURN. If you press the SPACE bar instead the data will not be saved onto your disk and all the work you have done will be lost.

5. SCREEN AND PRINTER OUTPUT

LOADING THE FILE

First you must load the class file. To do this you start at the MAIN MENU and select " 2) LOOK AT OR WORK WITH AN EXISTING FILE". Choose the file and it will be read in. The program will then automatically send you to the EXISTING FILE MENU. Now choose option #1. You will then be sent to the OUTPUT MENU, where you will be given several choices. Two printed forms may be generated: the CLASS RECORD FORM and the FINAL MARKS FORM. Examples of them may be found in Appendix 1.

SCREEN LIST

2.01-2.03 CHOOSE AND READ IN CLASS FILE; *M, *Q
EXISTING FILE MENU

2.10 OUTPUT MENU *M, *Q

2.11 SCREEN: NAMES, SEX HOMEROOMS

2.12 SCREEN: NAMES, PRESENT MARKS

2.13 SCREEN: NAMES, HOMEROOMS, OLD MARKS

2.14 READY THE PRINTER E = *M
PRINT CLASS LIST WITH
OLD MARKS, SPACES FOR
ATTENDANCE, NEW MARKS

2.15 READY THE PRINTER E = *M
PRINT CLASS LIST WITH
OLD AND NEW MARKS

All choices return to the EXISTING FILE MENU when the screen display or printing is finished.

NOTE ABOUT THE PRINTER

Don't ask for printed output if no printer is attached to the computer! Make sure that the printer is turned on, and is "ON LINE". Position the paper before printing anything out. This is done by positioning the perforations at the top of the sheet of paper just above the print head. Ask for help if you are not sure that everything is set up correctly.

All P.E.M.S. forms have an 80 column, 66 line per page format, which is the standard format for most printers. No DIP switches should need be set to produce these forms. Novice users should note that printers are occaisionally set for unusual output such as LOGO graphics or condensed print. If you have troubles with the printer it is probably for this reason. If the printer is set up normally you should have no difficulties.

6. ENTERING MARKS

HEADING: ENTER MARKS

SCREEN LIST

The only screen in this section is displayed below.

```
PEMS - CLASS LIST PROGRAM
C. MACKINTOSH  82-83          ENTER MARKS
DANCE. D-2
=========================================
                                SL CL GR
 9002 ADAIR, ALLAN              1+ 2  A
 9010 AYNSLEY; ADAM             1  2  B
 9012 BARR; GEORGE              1- 1  C
 9014 BAT; ELLEN                1  0  C-
 9034 BROWN; SUE                1  1  C
 9037 CAMERON; LINDA            1- 0  F
 9051 COLLINGWO; HELEN          1  1  C
 9056 GRABOW; FRED              1+ 1  B
 9058 GRAHAM; PENNY             2- 1  A
 9064 HATFIELD; HEINZ           1  :: ::
 9069 INGLIS; PHIL              :: :: ::
 9072 JEPSON; ALLAN             :: :: ::
 9078 JOINER; JANIS             :: :: ::
 9080 JOSS; RABINDER            :: :: ::
 9084 KALB; HEINZ               :: :: ::
-----------------------------------------
RETURN = NO CHANGE  LEFT ARROW = BACK UP
EX = EXIT MARK ENTRY  NX = NEXT PAGE
```

TITLE AREA

PROMPT AREA

The three marks entered for each student are skill or fitness level (SL); overall grade (GR); and cognitive level (CL). The scores that may be entered are:

```
SL:  3+ 3  3- 2+ 2  2- 1+ 1  1- ::
CL:  3  2  1  0  ::
GR:  A  B  C+ C  C- P  F  I  ::
```

The entry "::" means NO MARK RECORDED.

If you type in something other than the above marks or the commands written in the 'PROMPT AREA' at the bottom of the screen the computer will 'beep' and ask you to reenter the mark.

To enter the marks you simply type them in. After each individual mark is entered press RETURN and the computer will automatically move the cursor to the right place to enter the next mark.

PROMPT AREA COMMANDS:

RETURN: if you press RETURN instead of entering a mark the computer leaves the mark as it is and skips left to the next position. Pressing RETURN repeatedly shifts you down the screen.

LEFT ARROW KEY: skips to the next position to the right without changing the mark. It thus acts like the RETURN KEY except that it moves you in the opposite direction.

EX: typing EX gets you out of mark entry mode. You will then have the option of pressing RETURN to save what you have typed in onto your disk, or pressing the SPACE bar to cancel instead

NX: Only 15 students can be displayed on the screen at once. If there are more than 15 students in your class type NX to view the next 'page' of students. Typing NX repeatedly will loop you around to the first 'page' of students again.

REMINDER: Marks entered into the computer will not be remembered unless you save them onto your disk.

The program will return you to the EXISTING FILE MENU after mark entry.

7. TRANSFERRING MARKS TO THE MAIN DATA DISKS

HEADING: TRANSFER MARKS

SCREEN LIST

2.01-2.03 CHOOSE; READ IN CLASS FILE; EXISTING FILE MENU *M, *Q

2.31 OPTION TO LOOK AT MARKS: Y=GOTO OUTPUT MENU (2.10)

2.32 INSERT MAIN DATA DISK *M
if the wrong disk is
inserted then:
2.321 WRONG DISK
returns to 2.33

2.33 MARKS BEING TRANSFERRED
if two grades in the class
then repeat 2.32 - 2.33

2.34 MARKS TRANSFERRED

After the marks are transferred the program goes to the MAIN MENU.

8. ADD OR DROP STUDENTS FROM A CLASS FILE

HEADING: ADD OR DROP STUD.

SCREEN LIST

2.01-2.03 CHOOSE, READ IN FILE; EXISTING FILE MENU *M, *Q

2.40 ADD OR DROP MENU *M, *Q

2.411 ADD STUDENT - INSERT DATA DISK *M

2.412 ENTER STUDENT NUMBER *M
student read in from the disk

2.413 DISPLAY STUDENT'S NAME-CORECT?
Y = save; go to 2.412
N = cancel; go to 2.412

2.421 DROP STUDENT - *M
ENTER STUDENT NUMBER

2.422 DISPLAY STUDENT NAME
DROP (Y/N)
Y = dropped; go to EXISTING FILE MENU
N = go to 2.422

2.431 DISPLAY CLASS LIST
displays class list, then returns to 2.40

9. DELETING OLD CLASS FILES

HEADING: DELETE A FILE

SCREEN LIST

3.01-3.02 CHOOSE AND READ IN THE FILE *M, *Q

3.03 'HAVE YOU TRANSFERRED THE MARKS
TO THE MAIN DATA DISKS ?' (Y/N)
N = go to MAIN MENU
Y = continue

3.04 OPTION TO GET A PRINTOUT
Y = go to 2.10 (OUTPUT MENU)
N = continue

3.05 FILE IS DELETED

After the file is deleted you are returned to the MAIN MENU.

It is a good idea to get a printout of the marks for your records before you delete a file. A deleted file is gone forever.

10. INITIALISING A NEW TEACHER DISK

HEADING: CREATE A NEW DISK

SCREEN LIST

4.01	EXPLANATION	*M
4.02	INSERT NEW DISK	*M
4.03	ENTER TITLE disk is initialised	*M
4.04	WHAT TO DO NEXT	

After screen 4.04 you are returned to the MAIN MENU.

This routine is used to create new teacher disks. Teachers will want to initialise disks at the beginning of the school year because their old disks will be full.

What the routine does is to erase a the disk you put in, transfer the class list program onto the disk, and alllows you to set up a new title for the disk. Remember that the title, which usually consists of the teacher's name and the year, appears on all printouts and is always seen in the top left corner of the screen when the TEACHER disk is being used. A newly initialised disk will not, of course, have any class files on it.

If a teacher does not wish to retain last year's disk he may simply leave his own disk in the drive rather than inserting a new disk. All the class files on the disk will be erased.

APPENDIX 1 - FORMS GENERATED BY P.E.M.S.

A. CLASS LIST PROGRAM

1. Class Record Form
2. Final Marks Form

B. MASTER PROGRAM

1. Permanent Record Form
2. Master Student List

MCBRIDE 83-84 P.E.M.S. CLASS RECORD FORM

FILE NAME: BASKETBAL.DEC B1

STUD.#	NAME	PREVIOUS LEVELS SL	PREVIOUS LEVELS CL	ATTENDANCE	NEW MARKS SL	NEW MARKS P	NEW MARKS A	NEW MARKS C	NEW MARKS CL	NEW MARKS T	NEW MARKS GR
9011	ASTLE;DAVID										
9026	BROCKLESBY;GARY										
9038	COCKING;JENNIFER										
9047	DERUITER;KELLY										
9056	ECKARDT;KAORU	1-									
9059	FERDMAN;SOFIA										
9088	HOSDEN;NICOLA										
9089	HORNSBY;CATHY										
9098	JIMENO;JEFF										
9100	JOHNSON;GENEVIEVE										
9103	JORDISON;KIMBERLY										
9120	LAU;VIVIAN										
9128	LOK;VINCENT										
9137	MCGRATH;KELLY										
9156	NIWATSUKINO;YUMI										
9159	PARMAKSZIAN;ERIC										
9163	PIKE;CHRIS										
9166	PORTER;MAUREEN										
9168	PRIOLJAN;STELLA	1-									
9183	SAUNDERS;PATRICK										
9191	SHEW;ROBERT										
9200	ST DENIS;HUGHIE										
9221	VUIYALE;KEVA										
8005	BAILLIE;KASEY										
8030	CHAPOTELLE;JIM										
8044	DERRING;LISA										
8063	FOSTER;HEATHER										
8065	GIESBRECHT;BRENT										
8093	JARMANA;STEVEN										
8110	LEE;JAMES										
8123	MCKENZIE;SHELLY										
8138	NAST;GEORGE										
8155	ROBINSON;MIKE										

MCBRIDE 83-84 P.E.M.S. FINAL MARKS FOR

FILE NAME: BASKETBAL.DEC 81

STUD.#	NAME	OLD MARKS LV	OLD MARKS GD	OLD MARKS CG	NEW MARKS LV	NEW MARKS GD	NEW MARKS CG
9011	ASTLE;DAVID, 2				1	C	1
9026	BROCKLESBY;GARY, 4				1	C+	2
9038	COCKING;JENNIFER, 6				1-	C	1
9047	DERUITER;KELLY, 7				1+	B	2
9056	ECKARDT;KAORU, 8	1-	C		1	B	1
9059	FERDMAN;SOFIA, 9				1-	F	0
9088	HOBDEN;NICOLA, 13				1	C+	1
9089	HORNSBY;CATHY, 13				1-	C	1
9098	JIMENO;JEFF, 14				1	B	2
9100	JOHNSON;GENEVIEVE, 14				1	B	2
9103	JORDISON;KIMBERLY, 15				1+	C+	1
9120	LAU;VIVIAN, 8				1+	B	2
9128	LOK;VINCENT, 18				1	C+	2
9137	MCGRATH;KELLY, 19				1	C	1
9156	NIWATSUKINO;YUMI, 21				2	A	2
9159	PARMAKSZIAN;ERIC, 21				1-	F	0
9163	PIKE;CHRIS, 30				2	C+	1
9166	PORTER;MAUREEN, 22				1-	C	1
9168	PRIOLJAN;STELLA, 22	1-	C+		1+	B	2
9183	SAUNDERS;PATRICK, 23				1	C	1
9191	SHEW;ROBERT, 24				1+	B	2
9200	ST DENIS;HUGHIE, 23				1-	C-	1
9221	VUIYALE;KEVA, 11				1	C+	2
8005	BAILLIE;KASEY, 1				1-	C	2
8030	CHAPOTELLE;JIM, 4				1+	B	2
8044	DERRING;LISA, 6				1	C	1
8063	FOSTER;HEATHER, 8				1-	C	1
8065	GIESBRECHT;BRENT, 28				1	C+	2
8093	JARMANA;STEVEN, 12				1	C	1
8110	LEE;JAMES, 14				1-	C-	0
8123	MCKENZIE;SHELLY, 16				1	C+	2
8138	NAGT;GEORGE, 18				1+	B	2
8155	ROBINSON;MIKE, 22				2	A	2

PERMANENT RECORD FORM

11041 ROBINSON; ANNE F 12

UNIT SCORES

REPORT CARD MARKS	UNIT	GRADE 8 SL	GRADE 8 GD	GRADE 8 CL	GRADE 9 SL	GRADE 9 GD	GRADE 9 CL	GRADE 10 SL	GRADE 10 GD	GRADE 10 CL	GRADE 11 SL	GRADE 11 GD	GRADE 11 CL
	ACTIVE HEA				2	A	1	2+	A	2	2+	B	2
	AQUATICS												
	BADMINTON	1	C	0	1+	B	1	2	B	2			
(8) C+ B C+ C C+	BASKETBALL	1-	C+	1	1	C	1	1+	B	2	2	C+	2
	DANCE												
(9) B C C- C C	FIELD HOCK				1-	C-	0	1	C	1	1+	C+	1
	FLAG FOOTB												
(10) C+ B B A B	GYMNASTICS				1	C+	1				1	C	1
	LACROSSE												
(11) B C+ C+ C C+	OUTDOOR ED												
	RUGBY	1-	C+	1							1-	C	1
	SOFTBALL	1	B	1	1+	C	1	1+	B	2	1	C+	3
	SOCCER	1-	C+	1	1	C-	1	1	B	2	1	C+	3
	TEAM HANDB												
	TENNIS	1	B	1				2	A	1			
	TRACK/FIEL	1	C+	0	1	C	1				1	C	2
	VOLLEYBALL	1	C	0									
	WRESTLING							1-	B	1			
	SPECIAL PR												

MASTER STUDENT FORM - LIST OF ALL STUDENTS IN GRADE 9

STUDENTS 9001 TO 9100

9001	ADAIR;ALAN	M	1
9002	ADAM;HEIDI	F	1
9003	ADAMSON;LAURA	F	1
9004	AHN;STEVEN	M	34
9005	AICHINGER;ANDREA	F	1
9006	DICKER; TAMI	F	1
9007	ALDCORN;LUAN	F	1
9008	ANDERSON;HEATHER	F	4
9009	ARMSTRONG;DAN	M	33
9010	ARMSTRONG;SUSAN	F	33
9011	ASTLE;DAVID	M	2
9012	BARNETT;BRENT	M	2
9013	BARRON;GRAHAM	M	2
9014	BARSKI;CHERYL	F	2
9015	BASE;BELINDA	F	2
9016	BEAUDRY;BRYCE	M	2
9017	BECKER;JASON	M	3
9018	BHIMANI;YASHMIN	F	3
9019	BILCHEK;LISA	F	3
9020	BIRCH;BRAD	M	3
9021	BIRD;DIANE	F	3
9022	BIRD;TIMOTHY	M	30
9023	BOLTON;LALANI	F	3
9024	BRAVERMAN;STEPHEN	M	33
9025	BRITCH;MARIE	F	6
9026	BROCKLESBY;GARY	M	4
9027	BROWNE;KEVIN	M	4
9028	BUTLER;JASON	M	5
9029	CABLE;TRACEY	F	5
9030	CARDEY;DARRYL	F	5
9031	CHAN;ALVIN	M	5
9032	CHAN;CLETUS	M	5
9033	CHAPOTELLE;MICHEL	F	5
9034	CHOW;GORDON	M	5
9035	CHUBB;KELLY	F	6
9036	CLARKE;ANGELA	F	6
9037	CO;MARJORIE	F	6
9038	COCKING;JENNIFER	F	6
9039	COTE;TANYA	F	6
9040	COVE;MELENIE	F	6
9041	ROBINSON; ANNE	F	12
9042	CROSSLEY;JEFF	M	33
9043	CRUZ;GEEVIN	M	7
9044	DAVIES;CLARE	F	7
9045	DELANEY;LESLIE	F	7
9046	DEN DUYF;DARREN	M	7
9047	DERUITER;KELLY	F	7
9048	DESIDERIO;SHEILA	F	7
9049	DIARD;PATRICK	M	33
9050	DIGNARD;KELLY	F	8
9051	DOBBS;MARTIE	F	8
9052	DOCKRILL;MARTIN	M	8
9053	DUENAS;LISA	F	8
9054	DURBALL;DONNA	F	2
9055	EASTON;CHRISTOPHE	M	8
9056	ECKARDT;KAORU	F	8
9057	EVANS;GLEN	M	9
9058	FENTON;CHRISTOPHE	M	9
9059	FERDMAN;SOFIA	F	9
9060	FINCH;JUDI	F	9
9061	FITZSIMMONS;DAWN	F	9
9062	FLACHMAN;KELLY	F	33
9063	FLORENCE;JAMES	M	33
9064	FORBES;HUGH	M	10
9065	FOXWELL;DEAN	M	10
9066	FRASER;SHERYL	F	10
9067	FRAUENDORF;ANNE	F	10
9068	FRIGON;KAREN	F	10
9069	GAETZ;TODD	M	10
9070	GAMMIE;GAEL	F	10
9071	GAUNTLEY;TOM	M	11
9072	GERIG;ANTON	M	7
9073	GOMM;DARCEY	F	11
9074	GRAHN;CHARLES	M	11
9075	GRANT;DEBORAH	F	11
9076	GUNN;DANNY	M	11
9077	HADLAND;HOLLY	F	33
9078	HANCOCK;JENNIFER	F	12
9079	HANEY;ALLISON	F	12
9080	HARING;WENDY	F	12
9081	HAVERSTOCK;TAMMY	F	12
9082	HAY;CHARLENE	F	12
9083	HAYWARD;STEVE	M	12
9084	HEMSEL;RAMONA	F	12
9085	HIKIDA;TAMI	F	13
9086	HIMMELBAUER;ELANA	F	13
9087	HOBBS;SANDRA	F	13
9088	HOBDEN;NICOLA	F	13
9089	HORNSBY;CATHY	F	13
9090	HOVI;DEBBIE	F	13
9091	HUMENY;DARRYL	M	13
9092	IKUTA;DENISE	F	13
9093	JAMES;JENNIFER	F	34
9094	JANZEN;LEAH	F	13
9095	JENNINGS;SCOTT	M	13
9096	JERRITT;KRYSTAL	F	14
9097	JIMENO;CLAIRE	F	14
9098	JIMENO;JEFF	M	14
9099	JOHAL;BARBARA	F	14
9100	JOHNSON;GENEVIEVE	F	14

MASTER STUDENT FORM - LIST OF ALL STUDENTS IN GRADE 9

STUDENTS 9101 TO 9200

9101	JOHNSTONE;ROBERT	M	15
9102	JONES;IAN	M	15
9103	JORDISON;KIMBERLY	F	15
9104	KAKAZU;YUTAKA	M	15
9105	KALLNER;JOEL	M	15
9106	KARSAI;ALEX	M	15
9107	KARTYE;MELANIE	F	16
9108	KATAOKA;SACHI	F	16
9109	KIDD;TRACEY	F	16
9110	KING;AL	M	16
9111	KNIGHT;CATHERINE	F	16
9112	KOBAYASHI;TAMIKO	F	17
9113	KOENIG;RHONDA L	F	17
9114	KOZAKEVICH;LISA	F	17
9115	KRUGER;CALVIN	M	33
9116	KUBE;JENNY	F	17
9117	KULING;MYRIAM	F	33
9118	LAM;DAMIAN	M	17
9119	LANDSKRON;PATRICK	M	17
9120	LAU;VIVIAN	F	8
9121	LEE;ALVIN	M	17
9122	LEE;JOANN	F	18
9123	LEE;KATHY	F	18
9124	LEGG;RICKY	M	18
9125	LEVINE;GEOFFREY	M	18
9126	LIM;RALPH	M	18
9127	LIVINGSTONE;STEVE	M	18
9128	LOK;VINCENT	M	18
9129	LYON;AGGELINA	F	18
9130	LYONS;MICHAEL	M	19
9131	MANSADAP;MYLA	F	19
9132	MARKOVIC;TOMMY	M	19
9133	MARTIN;KARI	F	20
9134	MATSUNO;YUKI	F	20
9135	MCBRIDE;KERRY	F	19
9136	MCCABE;MANDY	F	19
9137	MCGRATH;KELLY	F	19
9138	MCLEAN;BONNIE	F	19
9139	MCNUTT;KIMBERLEY	F	19
9140	MCPHERSON;CRIS	F	19
9141	MECKLE;KEITH	M	20
9142	MILLER;SCOTT	M	20
9143	MILLS;COLIN	M	20
9144	MINAKER;ROBERT	M	34
9145	MIYAZAKI;VANCE	M	20
9146	MOHABIR;RICKY	M	20
9147	MONTGOMERY;SANDRA	F	20
9148	MORTON;HARRIS	M	20
9149	MUNG;BERNADETTE	F	20
9150	MUNG;DAVID	M	20
9151	MYTKO;KAREN	F	20
9152	NAGATA;LISA	F	20
9153	NAHORNIAK;CORI	F	20
9154	NEWSTEAD;LAURA	F	21
9155	NISHIKIHAMA;STEPH	M	21
9156	NIWATSUKINO;YUMI	F	21
9157	ORWICK;NADINE	F	21
9158	OSTASHEK;JULIE	F	21
9159	PARMAKSZIAN;ERIC	M	21
9160	PARNELL;BILLY	M	21
9161	PAUL;PAMELA	F	21
9162	PERRY;SCOTT	M	21
9163	PIKE;CHRIS	M	30
9164	PITCAIRN;MICHAEL	M	22
9165	POOLE;TRACEY	F	22
9166	PORTER;MAUREEN	F	22
9167	PRIATEL;DEREK	M	22
9168	PRIOLJAN;STELLA	F	22
9169	PRITCHARD;LISA	F	22
9170	PRUDEN;STEVE	M	22
9171	RAE;DARREN	M	22
9172	RANDALL;MICHAEL	M	22
9173	REDDIN;CAROL	F	22
9174	RENNSCHMID;RUSTIN	M	23
9175	RICZKER;ALLON	M	23
9176	RILEY;CLAYTON	M	23
9177	ROBERGE;RAELENE	F	23
9178	RUSSELL;CORINNE	F	23
9179	SAHOTA;KEN	M	23
9180	SAKAI;LYNN	F	23
9181	SAMONTE;JOHN	M	23
9182	SANEL;TAMMY	F	27
9183	SAUNDERS;PATRICK	M	23
9184	SCHAWORSKI;FRED	M	24
9185	SCHINDEL;MIKE	M	24
9186	SCHINDLER;KEVIN	M	24
9187	SCHLOSSAREK;TIM	M	24
9188	SCHMIDT;MIKE	M	24
9189	SENTES;COREY	M	24
9190	SEO;CHRISTINA	F	34
9191	SHEW;ROBERT	M	24
9192	SINGH;BOB	M	24
9193	SMITH;DOUG C	M	24
9194	SMITH;JULIE	F	4
9195	SMITH;LAURENCE	M	25
9196	SMITH;TRACY	F	25
9197	SORENSEN;KAREN	F	25
9198	SOURDIF;ERIK	M	25
9199	SPOCNER;BRYAN	M	6
9200	ST DENIS;HUGHIE	M	23

MASTER STUDENT FORM - LIST OF ALL STUDENTS IN GRADE 9

STUDENTS 9201 TO 9268

9201	STELTER;ERIK	M	26
9202	STEPHENS;SHERRY	F	26
9203	STEWART;HEATHER	F	26
9204	SURETTE;MICHELLE	F	26
9205	TANGUAY;RENE	M	34
9206	THOMAS;LYNDA	F	27
9207	THORBURN;KELLY	F	27
9208	TINGLEY;DARLENE	F	27
9209	TODRICK;JENNIFER	F	27
9210	TOMICKI;BRIAN	M	27
9211	TRIMBLE;HEATHER	F	26
9212	TSAI;VIVIAN	F	34
9213	TURNBULL;DONNA	F	27
9214	VAID;NEERAJA	F	28
9215	VALGARDSON;HALLIE	F	28
9216	VAN GYZEN;CHERYL	F	28
9217	VANDUYN;JULIET	F	28
9218	VENUS;ANDREW	M	29
9219	VINCENT;TERRY	M	29
9220	VIRANI;SHAFIG	M	32
9221	VUIYALE;KEVA	F	11
9222	WAECHTER;KIRK	M	29
9223	WALSH;VALMA	F	29
9224	WAN;RACHEL	F	34
9225	WATANABE;KENJI	M	29
9226	WEBER;BENITA	F	32
9227	WEBER;MICHAEL	M	34
9228	WEINSTEIN;MATHEW	M	29
9229	WESSELS;LESLIE	M	30
9230	WHITE;APRIL	F	30
9231	WHYTE;PAM	F	30
9232	WIDAS;CAROLYN	F	30
9233	WILSON;BRENT	M	31
9234	WINDSOR;LAURIE	F	31
9235	WINKELMANS;MIKKIE	F	31
9236	WONG;CANDACE	F	31
9237	WONG;MIKE	M	12
9238	WONG;WINSTON	M	31
9239	WOYKIN;KEVIN	M	31
9240	YAN;MALCOLM	M	32
9241	YEE;KEVIN	M	32
9242	YOSHIHARA;KAREN	M	32
9243	CONDE;CLAIRE	F	11
9244	WITHEY;TAMI	F	0
9245	MEYER;PAM	F	0
9246	LAKE;CINDY	F	0
9247	KRIEGER;DEREK	M	7
9248	LINDER;STACEY	M	1
9249	MEYER;PAM	F	4
9250	NEW;LAURA	F	20
9251	ROSELL;FRED	M	6
9252	SCHICK;ALEXIS	F	32
9253	SIDES;TODD	M	22
9254	TEATHER;BARBARA	F	26
9255	THOMAS;LINDA	F	27
9256	WANG;KENNETH	M	16
9257	WHITTY;ERIN	F	25
9258	CHEUNG; TIM	M	19
9259	BAINS;GURINDER	F	26
9260	BASSY;PARMJIT	F	11
9261	BEAUDRY;BRYCE	M	2
9262	BOWDEN;TINA	F	26
9263	CRIDDLE;MELINDA	F	5
9264	DELWO;BRETT	M	23
9265	GLOVER;JENNY	F	2
9266	GRAHAM;ANDY	M	2
9267	GRAY;SAMANTHA	F	12
9268	HOO;AARON	M	19

APPENDIX 2 - PROGRAMMERS TECHNICAL NOTES

CLASS LIST Program Structure

A. OVERALL

1-6100	Subroutines
6500-9999	Main Program
10000-10500	Dim statements, variable definition
20000+	End program routine

B. MAIN PROGRAM

6500 Read in index file: TEACHER-PEMS
6565 Title screen
6600 MAIN MENU
6700 Choose; read in class file
6900 EXISTING FILE MENU
7000 Create new class file
7500 OUTPUT MENU
7600 Screen output
7700 Printer output
8000 Enter/edit marks
8500 Transfer marks to the MAIN DATA disks(s)
9000 ADD OR DROP STUDENTS MENU
9100 Add a student to a class file
9300 Drop a student from a class file
9500 Delete a class file
9700 Initialise a new TEACHER disk

C. SUBROUTINES

1000 Print heading in screen line 1
1100 Print the name, sex, and homeroom of one student
1200 Print the name and previous marks of one student
1300 Print the name and prsent marks of one student
1400 Print the name; previous marks of one student: PRINTER
1500 print the name; old, new marks of one student: PRINTER

2000 Open a random access file: filename=F$
2100 Close file F$; exit disk mode
2200 Read REC 0 of a class file: Read in S1%(0); NU; G1; G2
2300 Write REC 0 of a class file: Write S1%(0); NU; G1; G2
2400 Write the name, sex, homeroom, and student number one student into a class file
2500 Write TI$,SE(0),SE(1) into REC 0 of index file TEACHER-PEMS
2700 Write one student's name, sex, homeroom, old and new marks into a class file
2800 Write one student's old, new marks into a class file
2900 Switches name, mark data of two students(cont. in 2 arrays)

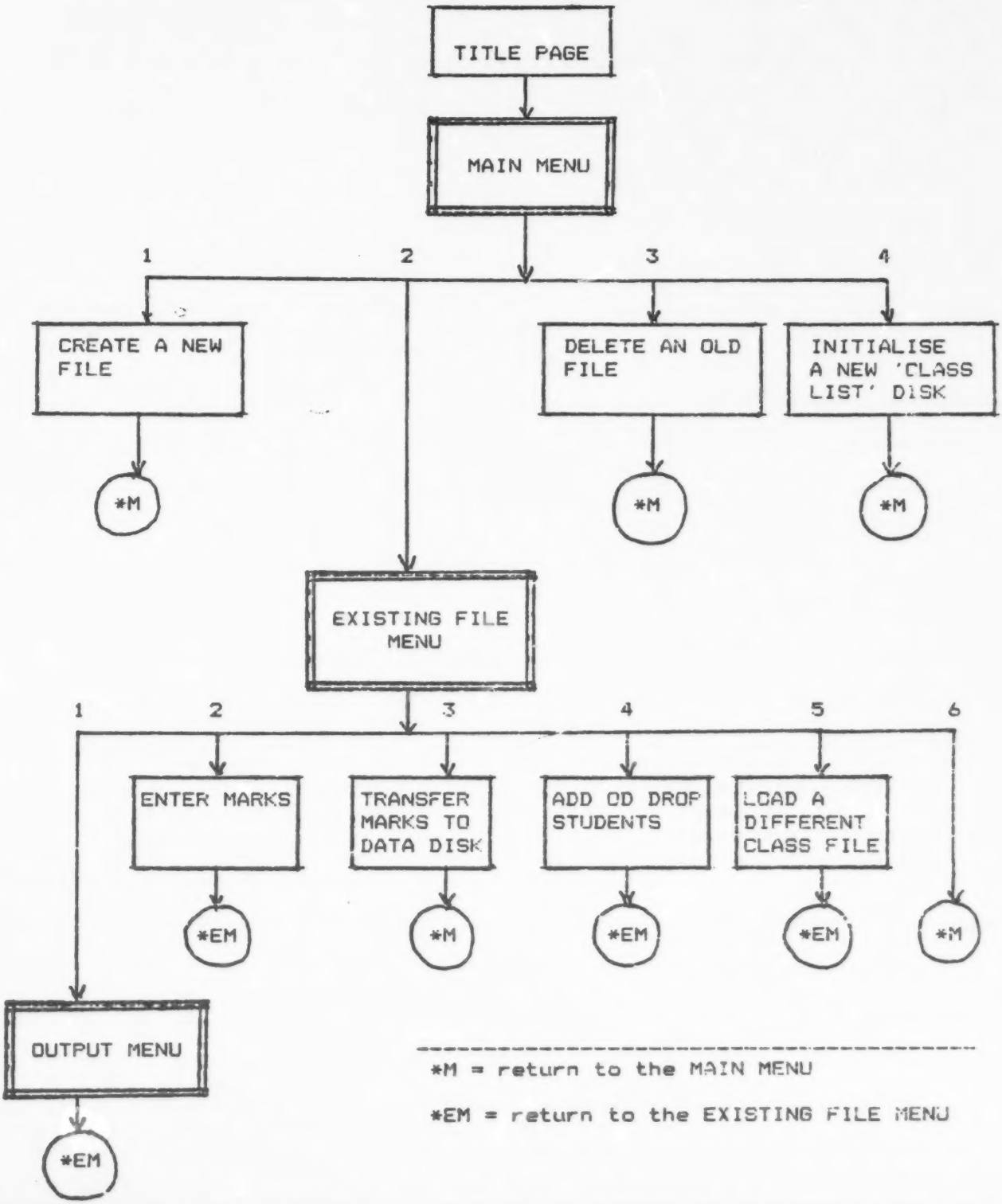
3000 Reads index file TEACHER-PEMS into an array
3100 Reads the grade and number of students in the grade from REC 0 of MAIN FILE - master file of a MAIN DATA disk
3400 Reads name, sex, homeroom of one student from the master file on a MAIN DATA disk
3500 Reads name, mark data from a class file into two arrays
3600 Reads in the marks achieved by a given student the last time he/she took the given unit

4000 Inputs one student's number from the screen
4100 Inputs up to 45 students' numbers from the screen

5000 'PRESS RETURN TO CONTINUE'
5100 Prints a row of 40 "=" on the screen
5300 MENU subroutine - used by all menus
5400 Prints a row of 40 Z$ on the screen-Z$ defined in program
5500 Screen output routine-displays up to three screens of name; mark data
5600 Displays the name of the class files on the screen-user then chooses the file to be read in
5700 Reads in a class file

6000 'COMPUTER IS TALKING TO THE DISK'-displayed on the screen during disk operations

CLASS LIST PROGRAM FLOW CHART



*M = return to the MAIN MENU

*EM = return to the EXISTING FILE MENU

PROGRAM FUNCTIONS

MASTER

1) add, drop students from MAIN DATA DISKS
2) edit or view on screen individual student records
3) print out Permanent Record cards
4) print out GRADE LIST-list of all students in a grade
5) initialise new DATA DISKS

CLASS LIST

1) create class files
2) print out ATTENDANCE FORMS
3) enter unit marks
4) tranfer marks to the MAIN DATA DISKS
5) delete old class files
6) initialise new TEACHER DISKS

MARKS STORED

Skill level: 3+, 3, 3-, 2+, 2, 2-, 1+, 1, 1-, :: (no mark)
Cognitive Level: 3, 2, 1, 0, :: (no mark)
Overall Grade: A, B, C+, C, C-, P, F, I, :: (no mark)

STUDENT NUMBER SYSTEM

student #10173 = 173rd student in Grade 10
student #8029 = 29th student in Grade 8

FORMS GENERATED

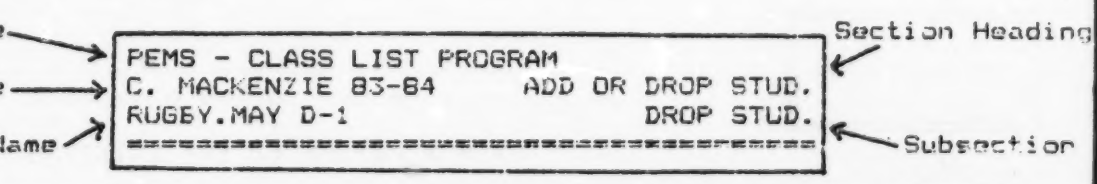
MASTER:

1) MASTER STUDENT FORM-list of the names, homeroom numbers, and sex of all the students in a grade
2) PERMANENT RECORD FORM-list of all the information stored in PEMS on a particular student; including his/her unit scores and report card marks for grades 8 to 11

CLASS LIST

1) CLASS RECORD FORM-lists the names of all the students in a class, with columns for recording attendance and marks.
2) FINAL MARK FORM-list of the marks received by the students in a class file. Includes for reference the marks they received the last time they took the unit

TITLE AREA OF CLASS LIST



Mod-L

1983-84 Physical Education Activity Schedule

Date	Grade 8's	Grade 9's + 10's
Sept 6-7	Orientation	Orientation
Sept 9-16	Fitness Testing	Fitness Testing
Sept 19- Oct 28	Tennis (Team Handball) Lacrosse	Fieldhockey (Soccer Team Handball
Oct 31- Nov 18	Dance	Dance
Nov 21- Dec 16	Gymnastics	Gymnastics
Jan 3- Jan 20	Dance	Dance
Jan 23- Jan 27	Semester Turnaround - Minor Games	
Jan 30- March 9	Wrestling (Active Health) Basketball	Wrestling (Active Health Badminton
March 11- April 27	Badminton (Fieldhockey or Rugby) Soccer	Basketball (Footbal Soccer
April 30- June 8	Softball (Volleyball) Fieldhockey	Tennis (Lacross Softball
June 11- June 15	Fitness Retesting	Fitness Retesting

Each class will participate in an aerobics - active health class once in every 2 weeks (as well as on rainy days).

APPENDIX D

PMS TEACHER QUESTIONNAIRE

D1

THE UNIVERSITY OF BRITISH COLUMBIA
MATH AND SCIENCE EDUCATION

June 15, 1983

THE P.E. TEACHERS
London Junior Secondary School
Richmond, B.C.

The year-long PEMS project is now drawing to a close. In return for the support given to us by ERIBC, we are required to make a detailed assessment of the effectiveness of PEMS in your school. I am sure you are aware of the significant amount of time invested in the project by Alex Carre, Bob Corbett, Bill Trembath, and myself. I certainly appreciate the time that you invested too.

To do the final assessment, it is necessary to collect a fairly large amount of detailed information. Attached is a questionnaire for that purpose. The questionnaire is fairly long; I expect it may take you more than an hour to answer all of the questions there. I am sorry to have to ask you to do this task in addition to what you have already done for the PEMS project, but the final report can only be made from your careful assessment of what happened.

I urge you to consider each questions carefully, and to answer them as fully as you can. Because of the significant changes we had to make in the project along the way, it may be that the questions I have posed do not address some significant aspect that you think should be considered. Please feel free to add anything you think important to your responses.

I have provided some UBC exam books in which to write your answers. Write your name on the front cover. Mark the question numbers "C1", "C2", "B1", "P2", etc. next to your responses so that I can figure out which questions you are answering.

I hope that I can have all of your responses back by October 17th. I will then endeavor to compile the results and have a final meeting with all of you before school is out.

Thanks again for all of your help on the PEMS project.

Sincerely,

Marv Westrom, Ph.D.
Math and Science Education, UBC

PEMS QUESTIONNAIRE FOR TEACHERS

Costs

The cost of the system consists of three major components:

1) The dollar cost of providing computing facilities.

2) The cost in clerical time of running the system.

3) The cost in teacher time of collecting the necessary data, putting it in a form suitable for computer use, and updating the data as needed.

COMPUTER COSTS. The cost of providing computing facilities is a function of the total cost of the facilities used apportioned over the amount of time that they are needed in running PEMS. In assessing this cost, we need the following information:

C1 What was the microcomputer configuration used for the PEMS system?

An Apple II+ with two disk drives was used. Are two disk drives necessary, or could a system with only one drive have been used? Was the printer adequate?

C2 Was the optimum PEMS microcomputer configuration available?

Is there any other computing equipment that might have been useful (such as a card reader)?

C3 How much computer time was used by clerical personnel for entering student demographic data, for initializing teacher diskettes, for editing student records, for printing forms and reports?

Bill Trembath did some data entry for teachers. You may have had some of your students do other data entry. DO NOT COUNT YOUR OWN TIME IN THIS SECTION. Please identify all tasks requiring the computer that were done for you by others, indicate who did the tasks, and estimate the time they needed the computer for each task.

C4 How much computer time is used by teachers for entering class marks, editing marks, making forms and reports?

Please indicate the PEMS tasks YOU did on the computer and estimate the amount of time you needed the computer for each task.

C5 What is the cost of supplies (diskettes, paper, ribbons) needed for PEMS operation?

How many diskettes did you personally use? Estimate how many sheets of computer paper you had printed (by yourself or by assistants). Please indicate any other consumable supplies that you used in operating PEMS.

CLERICAL COSTS. In assessing the cost in terms of clerical time we need the following information:

C6 How much clerical time was needed for running PEMS?

Bill Trembath and Gary McBride both did some clerical work for all teachers. Not counting yourself, Bill or Gary, if anyone else did some clerical work for you, please indicate the task, the individual, and an estimate of the amount of time they spent. (Your answer to this question will probably be very similar to your answer for C3.)

TEACHER COSTS. In assessing the cost in terms of teacher time we need the following information:

C7 How much teacher time is needed to follow the PECRG guidelines using the PEMS system.

The time you spent following the PECRG guidelines includes time spent running PEMS, as well as making student assessments, filling out forms, reviewing reports, etc. Please estimate the time it took you to learn to use PEMS (not counting any productive work); then estimate, for each class, how much total time you spent following the PECRG guidelines (including using PEMS).

C8 How much teacher time would be needed to follow the PECRG guidelines without the PEMS system.

Estimate how much time, per class, you would need to follow the PECRG guidelines if you had done it without using the PEMS system.

Benefits

The benefit of using PEMS is a function of the pedagogical value of the forms and reports generated by PEMS. If teachers see a strong value in using PECRG, then PEMS may also have a value in making these guidelines easier to use (by saving teachers' time).

There are three major possible benefits:

1) The educational value of using the Ministry of Education's PECRG recommendations. (While this is not strictly a benefit of PEMS, it is evaluated as a part of this study.)

2) The instructional value of having up-to-date reports concerning students' past achievement and current progress readily available.

3) The shifting of clerical and data management tasks from the teacher to the computer (and clerical assistant).

We need the following information:

B1 As a user of PECRG, do you believe that the system has an important instructional value in your P.E. classes? Explain.

B2 As a user of PEMS, do you believe that the forms and reports produced by PEMS have an important instructional value in your P.E. classes? Explain.

B3 As a user of PECRG both with and without PEMS, do you believe that using PEMS enables you to use the guidelines better? In what way(s)?

B4 What additional forms and reports could be produced by PEMS to make it more valuable?

Procedures

During this project, the operational procedures concerning the use of PEMS changed several times. In assessing the procedures, we need the following information:

P1 Who should do the clerical work? Could a part-time clerical person be trained to run PEMS?, is such a person necessary?, justified? Assuming part-time clerical assistance is needed, is the operation of PEMS compatible with regular school clerical tasks. Would a senior student be permitted to do this work? Can students capable of doing this work be found in a Junior High School? Could the work be done by a parent aide?

P2 Where should the PEMS computer be located? Do P.E. teachers need instant access, or can forms and reports be generated overnight? Are teachers willing to use the system in time slots allocated to them? Are any P.E. teachers 'afraid' of using a computer?

P3 Who should make the forms and reports? The teachers can make them directly or they can request the Data Clerk to make them. Having the Data Clerk make the forms and reports would save the teacher time and enable better scheduling of the computer, but the teachers may want their reports on short notice.

P4 Are there any changes you would like to see in the operation of PEMS if it were to be used next year? Can you make any suggestions for significant improvement?

Thank you very much for participating in our project. A copy of our results will be sent to you when it is ready.

POOR

QUALITY

ORIGINAL